

**NATIONAL WEATHER SERVICE INSTRUCTION 10-503  
DECEMBER 19, 2005**

**Operations and Services**

**Public Weather Services, NWSPD 10-5**

**WFO PUBLIC WEATHER FORECAST PRODUCTS SPECIFICATION**

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**NOTICE:** This publication is available at: <http://www.nws.noaa.gov/directives/>.

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**OPR:** W/OS22 (D. Young)

**Certified by:** W/OS22 (E. Jacks)

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**SUMMARY OF REVISIONS:** This directive supersedes NWSI 10-503, “WFO Public Weather Forecast Products Specification,” dated October 1, 2003. Changes are listed below. Note: bold type parenthetic expressions indicate the best time estimates for the specified software modifications.

- Modified product expiration times (**effective with AWIPS Operations Build [OB]7 release**)
- Modified Predominant Sky Cover thresholds and AFM/PFM codes (**effective with OB7 release**)
- Changed the AFM/PFM code for Volcanic Ashfall (**effective with OB7 release**)
- Requirement added for POP values to be included in ALL categorical forecasts (**effective with OB7 release**)
- Modified Tabular State Forecast (SFT) product to add nighttime PoPs (**effective with OB7 release or beyond**)
- Alphabetized products within directive
- Modified portions of Area Forecast Discussion and revised example in Appendix A
- Removed Pre-IFPS CCF format
- Added exception to allow delay (no more than 1.5 hours) in product issuance times due to tropical cyclone events (as per Hurricane Isabel Service Assessment Recommendation #1)
- Removed use of the word “Amended” in all product Update and Correction sections
- Removed “Election Day” from list of federally recognized holidays and added specificity as to when holidays should appear in the ZFP
- Modified Precipitation Intensity section
- Clarification of extreme temperature forecast expressions
- Modification of temperature ranges
- Added A.M. and P.M. PFM examples in Appendix A
- Removed Geographical Area Designator Map

signed

12/5/05

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Date

**WFO Public Weather Forecast Products Specification**

<u>Table of Contents:</u>	<u>Page</u>
<b>1. Introduction</b> .....	6
<b>2. Area Forecast Discussion (product category AFD)</b> .....	6
2.1 Mission Connection.....	6
2.2 Issuance Guidelines .....	6
2.2.1 Creation Software .....	6
2.2.2 Issuance Criteria .....	6
2.2.3 Issuance Time .....	6
2.2.4 Valid Time .....	6
2.2.5 Product Expiration Time.....	6
2.3 Technical Description.....	6
2.3.1 Universal Geographic Code (UGC) Type .....	6
2.3.2 MND Broadcast Instruction Line .....	6
2.3.3 MND Product Type Line .....	7
2.3.4 Content.....	7
2.3.5 Format.....	9
2.4 Updates and Corrections.....	12
<b>3. Area Forecast Matrices (product category AFM)</b> .....	12
3.1 Mission Connection.....	12
3.2 Issuance Guidelines .....	12
3.2.1 Creation Software.....	12
3.2.2 Issuance Criteria .....	12
3.2.3 Issuance Time .....	12
3.2.4 Valid Time.....	12
3.2.5 Product Expiration Time.....	12
3.3 Technical Description.....	12
3.3.1 UGC Type.....	13
3.3.2 MND Broadcast Instruction Line .....	13
3.3.3 MND Product Type Line.....	13
3.3.4 Content.....	13
3.3.4.1 Date/Time Block.....	13
3.3.4.2 Forecast Parameters .....	13
3.3.4.3 Special Instructions for Tropical Cyclones.....	19
3.3.5 Format.....	20
3.4 Updates and Corrections.....	21
<b>4. Coded Cities Forecast (product category CCF)</b> .....	22
4.1 Mission Connection.....	22
4.2 Issuance Guidelines.....	22
4.2.1 Creation Software .....	22

4.2.2	Issuance Criteria .....	22
4.2.3	Issuance Time .....	22
4.2.4	Valid Time .....	23
4.2.5	Product Expiration Time.....	23
4.3	Technical Description.....	23
4.3.1	MND Broadcast Line.....	23
4.3.2	MND Header.....	23
4.3.3	Content.....	23
4.3.3.1	Location Identifier .....	23
4.3.3.2	One-Word Daytime Forecasts.....	23
4.3.3.3	Temperature Forecasts .....	24
4.3.3.4	Forecaster Number.....	24
4.3.3.5	Probability of Precipitation (POP).....	24
4.3.3.6	Snowfall Amount (optional).....	25
4.3.4	Format.....	25
4.4	Updates and Corrections.....	26
<b>5.</b>	<b>Point Forecast Matrices (product category PFM)</b> .....	<b>26</b>
5.1	Mission Connection.....	26
5.2	Issuance Guidelines .....	26
5.2.1	Creation Software .....	26
5.2.2	Issuance Criteria .....	26
5.2.3	Issuance Time .....	27
5.2.4	Valid Time .....	27
5.2.5	Product Expiration Time.....	27
5.3	Technical Description.....	27
5.3.1	UGC Type.....	27
5.3.2	MND Broadcast Instruction Line .....	27
5.3.3	MND Product Type Line .....	27
5.3.4	Content.....	27
5.3.4.1	Date/Time Block.....	27
5.3.4.2	Forecast Parameters.....	28
5.3.4.3	Special Instructions for Hurricanes.....	33
5.3.5	Format.....	33
5.4	Updates and Corrections.....	34
<b>6.</b>	<b>Recreation Report (product category REC)</b> .....	<b>35</b>
6.1	Mission Connection.....	35
6.2	Issuance Guidelines .....	35
6.2.1	Creation Software .....	35
6.2.2	Issuance Criteria .....	35
6.2.3	Issuance Time .....	35
6.2.4	Valid Time .....	35
6.2.5	Product Expiration Time.....	35
6.2.6	Event Expiration Time.....	35
6.3	Technical Description.....	35
6.3.1	UGC Type.....	35

6.3.2	MND Broadcast Instruction Line .....	35
6.3.3	MND Product Type Line. ....	35
6.3.4	Content.....	35
6.3.5	Format.....	35
6.4	Updates and Corrections.....	36
<b>7.</b>	<b>State Forecast Product (product category SFP).</b> .....	<b>36</b>
7.1	Mission Connection.....	36
7.2	Issuance Guidelines.....	36
7.2.1	Creation Software. ....	36
7.2.2	Issuance Criteria. ....	36
7.2.3	Issuance Time. ....	36
7.2.4	Valid Time .....	36
7.2.5	Product Expiration Time.....	36
7.3	Technical Description.....	36
7.3.1	UGC Type.....	36
7.3.2	MND Broadcast Instruction Line. ....	36
7.3.3	MND Product Type Line. ....	37
7.3.4	Format.....	37
	7.3.4.1 Combining Periods.....	37
	7.3.4.2 One Geographic Forecast Segment.....	37
	7.3.4.3 Multiple Geographic Forecast Segments. ....	37
7.3.5	Content.....	38
	7.3.5.1 References to Locations.....	40
7.4	Updates and Corrections.....	40
<b>8.</b>	<b>Tabular State Forecast Product (product category SFT)</b> .....	<b>40</b>
8.1	Mission Connection.....	40
8.2	Issuance Guidelines .....	40
8.2.1	Creation Software. ....	40
8.2.2	Issuance Criteria. ....	40
8.2.3	Issuance Time .....	40
8.2.4	Valid Time. ....	40
8.2.5	Product Expiration Time.....	40
8.3	Technical Description.....	41
8.3.1	UGC Type.....	41
8.3.2	MND Broadcast Instruction Line. ....	41
8.3.3	MND Product Type Line. ....	41
8.3.4	Content.....	41
	8.3.4.1 Product Header. ....	41
	8.3.4.2 Table Header.....	41
	8.3.4.3 Significant Weather. ....	42
	8.3.4.4 Temperature. ....	42
	8.3.4.5 Probability of Precipitation.....	42
	8.3.4.6 Geographical Regions.....	42
8.3.5	Format.....	42
8.4	Updates and Corrections.....	44

<b>9. Zone Forecast Product (product category ZFP)</b> .....	45
9.1 Mission Connection.....	45
9.2 Issuance Guidelines.....	45
9.2.1 Creation Software.....	45
9.2.2 Issuance Criteria .....	45
9.2.3 Issuance Time.....	45
9.2.4 Valid Time .....	45
9.2.5 Product Expiration Time.....	45
9.3 Technical Description.....	45
9.3.1 Universal Geographic Code (UGC) Type .....	45
9.3.2 Mass News Disseminator (MND) Broadcast Instruction Line.....	45
9.3.3 MND Product Type Line.....	45
9.3.4 Format.....	46
9.3.4.1 Combining Periods.....	47
9.3.5 Content.....	47
9.3.5.1 References to Holidays.....	48
9.3.5.2 Headlines.....	48
9.3.5.3 Precipitation and Probability of Precipitation (POP) Forecasts.....	49
9.3.5.4 Sky Condition .....	52
9.3.5.5 Temperature .....	53
9.3.5.6 Wind.....	54
9.3.5.7 Visibility Restrictions .....	56
9.4 Updates and Corrections.....	57
9.4.1 ZFP Update.....	58
9.4.2 ZFP Correction.....	58

## Appendices

A. Product Guidelines and Examples.....	A-1
B. Definitions and General Terminology.....	B-1
C. Federal Meteorological Handbook No. 1 (FMH-1), “Surface Weather Observations and Reports”.....	C-1
D. U.S. Department of Transportation FAA 7340.1[X] Contractions (Web Link).....	D-1

1. **Introduction.** This procedural instruction provides product specifications for the main alphanumeric public products issued by the National Weather Service (NWS) Weather Forecast Offices (WFOs). Specifications include the guidelines associated with these products, detailed content, and format for each product type. The NWS is continuing to transition from providing weather forecast and warning information primarily via scheduled text products, to providing more detailed information derived from a digital forecast database. Digital forecast products dictated by events may be in the form of text, tabular, or graphics. While most products in this instruction are prepared by automated formatters extracting information from a digital forecast database, others are created using a mixture of manual preparation and product formatters.

2. **Area Forecast Discussion (product category AFD).**

2.1 **Mission Connection.** The Area Forecast Discussion (AFD) is a semi-technical product primarily used as a means to explain the scientific rationale behind a forecast and summarize watches, warnings and/or advisories in effect. This highly visible product is used to convey forecast and watch/warning/advisory information primarily to federal agencies, weather sensitive officials, and the media. The AFD is also useful for coordination among WFOs and River Forecast Centers, National Centers, and CWSUs. The forecast insight provided in the AFD is beyond that which can be found in other NWS products.

2.2 **Issuance Guidelines.**

2.2.1 **Creation Software.** The AFD should be composed using the Advanced Weather Interactive Processing System (AWIPS) Interactive Forecast Preparation System (IFPS) preformatted AFD shell, or other text editor.

2.2.2 **Issuance Criteria.** The AFD is issued at least twice a day by all WFOs in accordance with the mandatory Zone Forecast Product (ZFP) issuances. AFDs should be issued more frequently to provide reasoning for forecast updates or to provide an explanation of rapidly-evolving mesoscale trends.

2.2.3 **Issuance Time.** WFOs should issue AFDs within the 2-hour period preceding or 1-hour period following the release of the ZFP. AFDs should be issued within 1-hour prior to, or after updated forecast packages.

2.2.4 **Valid Time.** AFDs are valid from time of release until the next complete update.

2.2.5 **Product Expiration Time.** AFDs do not contain a product expiration time.

2.3 **Technical Description.** AFDs should follow the format and content described in the following section.

2.3.1 **Universal Geographic Code (UGC) Type.** There is no UGC coding associated with the AFD product.

2.3.2 **MND Broadcast Instruction Line.** There is no MND Broadcast Instruction Line associated with this product.

2.3.3 MND Product Type Line. All WFOs will use the AFD MND header, “AREA FORECAST DISCUSSION.”

2.3.4 Content. The AFD consists of two primary sections: (1) a narrative description of forecast information and reasoning, and (2) a summary of public, marine and fire weather outlook/watch/ warning/advisory issuances. The discussions should focus on the most significant weather issues to affect a WFO’s geographic area of responsibility during the seven day forecast period. Emphasis should be placed on those forecast periods where outlooks/watches/warnings/ advisories are in effect, proposed, or are being considered. The narrative content of this product should be professional and remain focused on the meteorology. Editorial comments are inappropriate.

a. Narrative Discussion. The narrative discussion is a concise explanation of forecast reasoning and should express the deliberations made by the WFO forecast team, as well as consensus decisions with adjacent offices, River Forecast Centers, and National Centers. Use of data sources, such as the WSR-88D, ASOS, Profiler, satellite, local and national models, and local and national analysis are encouraged. The discussion should emphasize significant aspects of the forecast such as:

- (1) identification of the most significant hydrometeorological weather to affect the geographical area of responsibility during the 7 Day forecast period;
- (2) identification of the forecast problem(s)-of-the-day and explanation of their solution (s);
- (3) an indication of forecast team confidence and probabilistic guidance on weather possibilities not found in other products;
- (4) reasoning behind watch/warning/advisory issuance;
- (5) differences in model guidance and an indication as to which model appears the most correct and why;
- (6) reasoning for varying significantly from automated model output guidance products;
- (7) reasons for significant changes from the previous forecast;
- (8) expected timing of events such as beginning or ending of precipitation and degree of uncertainty;
- (9) a brief review of the synoptic situation.

b. Watch/Warning/Advisory Block. The Watch/Warning/Advisory Block (see Appendix A, section 1 for an example) is used to summarize public, fire weather

and marine long duration hazardous weather contained in the associated forecast package. Include the watch/warning/advisory block in all AFDs in a separate section after the narrative discussion.

- (1) Hurricanes and Tropical Storms. WFOs will also include watches and warnings for hurricanes and tropical storms affecting their geographic area of responsibility.
- (2) Exclusions. WFOs should not list short duration warnings (of a few hours or less) for convective events, and flash floods; severe thunderstorm and tornado watches; or flood warnings.

No formal coding schemes for the watch/warning/advisory block are required. The areas affected may be described geographically and/or by forecast zones. Well known contractions are permitted in this section. If zones are not referenced, the geographical description should be detailed enough to allow for an accurate interpretation of the referenced area. For example, instead of just "NRN," add a fraction or delineate with reference to station identifiers and/or prominent topographic features (such as "NRN QTR" or "NRN MO N OF MO RVR"). If topographic features are used without zone references, their approximate location within the state should be given. An example without zones would be "MT SHASTA SISKIYOU AREA OF XTRM NRN CA."

When no public and marine watch/warning/advisory information is needed, use the word "NONE."

- c. Preliminary Point Temperatures and POPs. At regional discretion, the forecaster may include preliminary point forecasts of temperatures and/or probability of precipitation for key locations following the narrative (see section 9.3.4 for specific format).
- d. Use of Contractions. AFDs should be composed in plain language using complete words. Limited use of contractions is permitted (e.g., to avoid repetition of lengthy terms, or to allow forecasters to save time by expressing their thoughts more concisely) under the following two circumstances:
  - (1) All contractions will come from the United States Aeronautical Contractions Handbook 7340.1[x], where "x" is the most recent version NWS contractions should be used as a first choice. If an NWS contraction cannot be found for a particular term, a contraction from other sources within the handbook is permitted (see Appendix D).

and,

- (2) Contractions should be well-known by the user community (e.g., PAC NW for Pacific Northwest, TSTMS for thunderstorms, etc.).

2.3.5 Format. The AFD is a single segment narrative product. At a minimum, a mandatory discussion identifier is used to organize the narrative discussion. Various other topic dividers may be used to organize, clarify, and allow for automatic retrieval of information from the product. When these optional section identifiers are used, they must be entered exactly as shown below --using the same spelling, preceded by a period (.), and followed by three periods (...). The information that follows may either be on the same line or on subsequent lines (See Figure 1).

2.3.5.1 Narrative and Use of Topic Dividers. The narrative is primarily a free form text section. However, topic dividers are used to highlight the text which follows, and allow for automatic retrieval of program specific information. If used, there will be no deviation from exact spelling and format. Each topic will be followed by a double ampersand “&&” and a line feed to indicate the end of the section.

To begin the AFD narrative section, either use introductory topic divider format (a), or divider format (b) below (also See Figure 1).

- a. .DISCUSSION...
- or**
- b. .SHORT TERM [Time Period]... **and** .LONG TERM [Time Period]...  
(used in conjunction with one another)

All other topic dividers are optional, and should be included as appropriate. The following is a comprehensive list of the topic dividers:

- ◆ .UPDATE...[Insert brief reason for forecast update. Provide additional details within .SHORT TERM/.LONG TERM or .DISCUSSION sections]
- ◆ .PREV DISCUSSION [HHMM]...[Append previous AFDs (or significant portions thereof. Do not include delimiters or the Watch/Warning/Advisory Blocks from the previous AFDs)]
- ◆ .SYNOPSIS...[Insert brief wx depiction & movement of systems]
- ◆ .MARINE.....[Insert marine weather /sea state information]
- ◆ .AVIATION...[Insert aviation weather/cig and vsby information]
- ◆ .FIRE WEATHER...[Insert fire weather information/low rh, strong wind, dry lgt.]
- ◆ .HYDROLOGY...[Insert hydrologic information/QPF, rivers]
- ◆ .CLIMATE...[Insert climatological information/records, long range outlook]
- ◆ .PRELIMINARY POINT TEMPS/POPS...[Insert temp/pop data - use plain language site names for easy identification]

Topic dividers should be logically ordered *beneath* the mandatory introductory dividers based on the significance of the information. However, there are *two exceptions* as follows:

- (1) If “.SYNOPSIS...” is used, it should be ordered *above* the mandatory introductory divider as a broad overview to the discussion that follows.

- (2) If “.UPDATE...” is used, it should be ordered *above* the mandatory introductory divider to ensure it is not overlooked by the reader. If the update also refers to the synopsis portion, the “.UPDATE...” may be placed above the “.SYNOPSIS...” section as appropriate.

When a WFO generates preliminary point temps/pops, the “.PRELIMINARY POINT TEMPS/POPS...” should be the *final* topic divider.

2.3.5.2 Watch/Warning/Advisory Block. The Watch/Warning/Advisory Block is a list of the active hazards and the areas affected. This section will be formatted as follows:

“ .XXX WATCHES/WARNINGS/ADVISORIES . . . ” beginning at the left margin and one blank line below the last line of the text, where XXX is the modernized three letter identifier of the issuing office. If a WFO’s County Warning and Forecast Area (CWFA) falls entirely within one state, the use of state identifications are not necessary. If a WFO’s CWFA covers multiple states, begin a new line with the two-letter state identification followed by three dots (...) and the list of watches, warnings and advisories applicable to that state. (See Figure 1 for format example).

FXaaii cccc ddhhmm AFDxxx	<i>WMO heading AWIPS ID</i>
<u>Product Format</u>	<u>Description of Entry</u>
AREA FORECAST DISCUSSION (see section 5.3.3 for exceptions) NATIONAL WEATHER SERVICE city state time am/pm time_zone day mon dd yyyy	<i>(MND/NWS Product Name) (Issuing Office or Agency) (Issuing Time/Date)</i>
...[headline to highlight any topical forecast information]...	<i>(Topical Headline - Optional)</i>
.UPDATE... &&	<i>(Optional, but if used it should appear above the introductory divider and may appear above .SYNOPSIS as appropriate)</i>
.SYNOPSIS... &&	<i>(Optional, but if used it should appear above the introductory divider)</i>
.DISCUSSION... <i>or</i>	<i>(Mandatory)</i>
.SHORT TERM [time period]... .LONG TERM [time period]...  [insert narrative text]	
&&	
.PREV DISCUSSION... &&	<i>(Optional)</i>
.MARINE... &&	<i>(Optional)</i>
.AVIATION... &&	<i>(Optional)</i>
.FIRE WEATHER... &&	<i>(Optional)</i>
.HYDROLOGY... &&	<i>(Optional)</i>
.CLIMATE... &&	<i>(Optional)</i>
.PRELIMINARY POINT TEMPS/POPS... site name ttt ttt ttt ttt / ppp ppp ppp ppp site name ttt ttt ttt ttt / ppp ppp ppp ppp etc... &&	<i>(Optional)</i>
.[XXX] WATCHES/WARNINGS/ADVISORIES...(where XXX=issuing office 3-letter identifier) [watch, warning, advisory information and associated locations or enter the word "NONE" followed by a period]	
<i>OR...FOR MULTIPLE STATES USE THE FOLLOWING FORMAT:</i>	
[ST]...[watch, warning, advisory information and associated locations or NONE]. (where ST = two letter state ID)	
[ST]...[watch, warning, advisory information and associated locations or NONE].	
\$\$ Name/Initials/Forecaster ID(s)	<i>(Optional)</i>

**Figure 1.** Area Forecast Discussion Product Format.

2.4 Updates and Corrections. AFDs should be updated between regular issuances to explain major changes to the forecast, to provide a technical explanation of mesoscale trends, or supply information which may be of particular interest to users. A previous AFD (or significant portions of a previous AFD) may be appended to the update to provide background information and a more thorough discussion of the entire forecast. For clarity, the issuance time of the previous AFD should also be included. WFOs will correct AFDs for format and grammatical errors as required.

### 3. Area Forecast Matrices (product category AFM).

3.1 Mission Connection. The Area Forecast Matrices (AFM) product displays various forecasted and derived weather parameters for areas specified in the valid ZFP at 3-hour, 6-hour, and/or 12-hour intervals. The AFM is intended for use by large volume users of NWS forecast information and for use by the general public. The quasi-static matrix format of the AFM allows for rapid visual scanning of a large number of forecast parameters/values. In addition, the forecast data is decodable by computers for those who wish to create derived products. Information in the AFM is provided to users as supplemental detail and/or higher resolution detail than can be found in other standard NWS products. Through the AFM product, the NWS strives to improve communications to the public and hazards community, increase forecast resolution, provide users with information on which they can base their decisions, and increase forecast and warning accessibility.

#### 3.2 Issuance Guidelines.

3.2.1 Creation Software. This product is created using IFPS software.

3.2.2 Issuance Criteria. The AFM is an *optional* product issued for all forecast areas contained in the valid ZFP. The AFM should be issued whenever necessary to always depict the latest expected weather conditions through Day 7.

3.2.3 Issuance Time. The AFM is an event-driven product and may be issued at any time. However, at a minimum the AFM should be issued twice daily to remove the outdated first period of the forecast. These issuance times should occur no later than 4:00 a.m. and 4:00 p.m. local time with one exception. During a tropical cyclone event, WFOs may delay the morning and/or afternoon issuance of the AFM until after the Tropical Prediction Center issues its advisories. In these circumstances, the AFM should be issued as soon as reasonably possible, and no later than 1.5 hours after receiving the TPC message.

3.2.4 Valid Time. The AFM is valid from the time of release through Day 7.

3.2.5 Product Expiration Time. The AFM product expires upon reaching the next mandatory issuance time.

3.3 Technical Description. AFMs should follow the format and content described in the following section.

3.3.1 UGC Type. The AFM will use the (Z) form of the UGC.

3.3.2 MND Broadcast Instruction Line. AFMs do not contain an MND Broadcast Instruction Line.

3.3.3 MND Product Type Line. The Area Forecast Matrices MND line is, “AREA FORECAST MATRICES.”

3.3.4 Content. The following section describes the detailed content of the AFM product.

3.3.4.1 Date/Time Block. Below the product issuance time/date, the forecast date and time blocks will be displayed. The day of the week will be expressed by the standard 3-letter identifiers (SUN, MON, TUE, WED, THU, FRI, SAT) followed by the month, day and year (MM/DD/YY). The day and date labels are left justified above the 6:00 a.m. local time hour.

The following two lines provide the forecast times at 3 hour intervals (indicated by 3HRLY) out to 60 hours (2 ½ days) into the future. Listed on the far left of the time lines are the 3-letter time zone abbreviations (e.g., UTC, EST etc.). The Universal Time Coordinate (UTC) will always be listed on the first line, followed by the local time for the area covered by the AFM. In this example, the “EST 3HRLY” indicates that the time zone is Eastern Standard Time (EST), and the minimum forecast interval for any parameter is 3 hours.

The second block is valid from 66 hours through Day 7. Once again, the local time zone is EST, but the forecast time intervals are at least 6 hours (indicated by 6HRLY). Some of the time intervals are 12 hours (See Figures 2 and 3).

DATE	MON 02/12/01	TUE 02/13/01	WED 02/14/01	
UTC 3HRLY	08 11 14 17 20 23 02 05 08 11 14 17 20 23 02 05 08 11 14 17 20 23			
EST 3HRLY	03 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 15 18			
DATE	THU 02/15/01	FRI 02/16/01	SAT 02/17/01	SUN 02/18/01
UTC 6HRLY	05 11 17 23 05 11 17 23 05 11 17 23 05 11 17 23 05			
EST 6HRLY	00 06 12 18 00 06 12 18 00 06 12 18 00 06 12 18 00			

**Figure 2.** AFM Date/Time Block.

3.3.4.2 Forecast Parameters. The following AFM forecast parameters are listed in order of their appearance within the product. Most elements are valid at the top of the hour indicated and then applied to the following 59 minutes. Elements valid for multiple hours (e.g., QPF, PoP, AVG CLOUDS) are referenced by the hour the forecast period ends. Precipitation Type parameters are independent and will only appear in the 3HRLY and/or 6HRLY blocks when forecast. Other elements such as Wind Chill and Heat Index are seasonal as defined by the local office. Watch, Warning, and Advisory information will also appear only when forecast.

- a. MAX/MIN. (*Alternatively labeled as MIN/MAX for afternoon issuance*)  
A forecast of maximum or minimum temperatures in degrees Fahrenheit (°F). The MAX temperature is valid for the period 7:00 a.m. through 7:00 p.m. local standard time, and “MIN” is valid for 7:00 p.m. through 8:00 a.m. local standard

time (note that due to a 3-hour minimum time resolution, this element is right justified in the column beneath the *approximate* ending time of the MAX/MIN period). The nighttime MIN and daytime MAX may be displayed as single integer (e.g., -2, 8, 53, 102) , or as a range (e.g., 54 56 60) if the MAX/MIN temperatures are expected to vary across the area. For example, in Figure 3 a temperature range of 36 to 39 degrees is forecast for an early morning minimum on Tuesday 2/12/01 (In AFM area forecasts, the middle number within the range is the representative single value for that area.) *MAX/MIN is forecast out through Day 7.*

- b. TEMP. TEMP is a snapshot of the expected temperature in degrees F valid at the indicated hour. The temperature is right justified in the column below the hour to which it refers. For example, in Figure 3 the forecasted temperature for 6:00 a.m. EST Wednesday 02/14/01 is 46 degrees F. *TEMP is available at 3-hour projections through 60 hours, then 6-hour projections through Day 7.*
- c. DEWPT. DEWPT is a snapshot of the expected dew point temperature in degrees F for the same time periods as its corresponding temperature forecast. DEWPT is located directly below the temperature line.
- d. RH. The relative humidity (RH) is a snapshot of the expected RH for the same time periods as its corresponding temperature and dew point forecast. The RH row is located directly below the “DEWPT” row. For example, in Figure 3 the RH at 3:00 p.m. (1500 hours) on 02/12/01 is based on a temperature of 46 degrees F and a dew point of 22 degrees F. The RH is 38%. *RH is available at 3-hour projections through 60 hours.*
- e. WIND DIR. WIND DIR is a snapshot of the expected wind direction forecast to occur at the indicated hour, using the 8 points of a compass (i.e., N, NE, E, SE, S, SW, W, NW). For example, in Figure 3 the forecasted prevailing wind direction, i.e., the direction from which the wind is blowing, at 9:00 a.m. EST Monday 02/12/01 is Northwest (NW). If a calm wind is forecast, double zeros (00) will be listed in place of a wind direction. WIND DIR is located below the hour to which it refers. *WIND DIR is available at 3-hour projections out to 60 hours.* (Note special exception to wind direction for tropical cyclones in section 3.3.4.3.)

In the 6HRLY block, **PWIND DIR** is the “predominant” wind direction for the area during the 12-hour period between 6:00 a.m. and 6:00 p.m., or 6:00 p.m. and 6:00 a.m. local time. *PWIND DIR is available beyond 60 hours through Day 7.*

- f. WIND SPD. WIND SPD is a snapshot of the sustained wind speed in miles per hour (MPH) forecast to occur at the indicated hour. For example, in Figure 3 the forecasted wind speed at 3:00 p.m. (1500 hours) EST Tuesday 02/13/01 is 36 MPH. If a calm wind is forecast, double zeros (00) will be listed in place of a wind speed. (Note special exception to wind speed for tropical cyclones in section 3.3.4.3) *WIND SPD is valid at 3-hour projections out to 60 hours.*

WIND CHAR codes are used beyond 60 hours through Day 7 of the forecast and denote the character of the wind for the 12-hour period between 6:00 a.m. and 6:00 p.m., or 6:00 p.m. and 6:00 a.m. WIND CHAR is comprised of range categories used in conjunction with deterministic wind speeds. Each range category is equated to a descriptive wind term, i.e., a “wind character” to best describe the MAXIMUM SUSTAINED wind speed during the period. For example, in Figure 3, on Saturday 02/17/01 during the 12-hour period between 6:00 a.m. and 6:00 p.m., the AFM code “WY” indicates that the period is expected to be “WINDY” with maximum sustained speeds in the range of 23 to 30 mph. See Table 1 below for the complete list of AFM wind categories.

Wind Character Codes	Wind Character	12-hr Maximum Sustained Wind Speed
LT	Light	< 8 mph
GN	Gentle	8 - 14 mph
BZ	Breezy	15 - 22 mph
WY	Windy	23 - 30 mph
VW	Very Windy	31 - 39 mph
SD	Strong/Damaging	≥ 40 mph

**Table 1.** AFM Wind Character Codes.

- g. WIND GUST. A wind gust row will appear in the 3HRLY block whenever forecasted wind gusts exceed the sustained wind speed (WIND SPD) by at least 10 MPH. WIND GUST is a snapshot valid on the hour indicated at the top of the corresponding column. For example, in Figure 2, the maximum wind gust at 6:00 p.m. (1800 hours) EST Tuesday 02/13/01 is forecast to be 52 MPH. *WIND GUST is a snapshot of gusts of wind occurring at the indicated hour and is available at 3-hour projections through 60 hours.* (Note special exception to wind gust for hurricanes in section 3.3.4.3)
  
- h. CLOUDS. The CLOUDS category provides a snapshot of sky coverage during the indicated hour. CLOUDS is divided into five category codes ranging from clear to overcast. Each code represents an equivalent percentage of opaque sky cover in percent. *CLOUDS parameter is included at 3-hour projections out to 60 hours.* In the 6HOURLY section, AVG CLOUDS is valid for 6-hour intervals beyond 60 hours through Day 7 and denotes the average amount of all opaque clouds during the 6-hour period ending on the hour indicated at the top of the column. The complete cloud codes and equivalent sky cover definitions are shown in Table 2.

AFM Sky Cover Code	Predominant Sky Cover (Opaque Cloud Coverage in Percent)	Equivalent Sky Cover Expressions
CL	0% to ≤ 5%	SUNNY or CLEAR
FW	> 5% and ≤ 25%	SUNNY or MOSTLY CLEAR
SC	> 25% and ≤ 50%	MOSTLY SUNNY or PARTLY CLOUDY
B1	> 50% and ≤ 69%	PARTLY SUNNY or MOSTLY CLOUDY
B2	> 69% and ≤ 87%	MOSTLY CLOUDY or CONSIDERABLE CLOUDINESS
OV	> 87% and 100%	CLOUDY or OVERCAST

**Table 2.** AFM Sky Cover Codes.

- i. **POP 12HR.** Probability of Precipitation (POP), is defined as the likelihood, expressed as a percent, of a measurable precipitation event (1/100th of an inch) at any given point within the forecast area(s) covered by the AFM. The “12HR” refers to the 12-hour valid time ending at 6:00 a.m. or 6:00 p.m. local time (0600 or 1800). The POP 12HR values that may appear in the AFM are as follows: 0, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100. These values are right justified in the column beneath the hour defining the ending time of the valid period. In Figure 2, there is a 70% chance of precipitation during the 12-hour period between 6:00 p.m. EST Tuesday 02/13/01 and 6:00 a.m. EST 2/14/01. *POP 12HR is forecast through Day 7.*
- j. **QPF 12HR.** This parameter, quantitative precipitation forecast (QPF) represents the total amount of liquid precipitation, in inches, expected during a 12-hour period ending at 6:00 a.m., or 6:00 p.m. local time at any point in the forecast area. The QPF is presented in locally defined ranges, (e.g., .10-.24), or single values. The QPF 12HR value is right justified in the column beneath the hour defining the ending time of the expected precipitation. For example, in Figure 2, the QPF 12HR indicates that a total of .25-.49 inches of precipitation is expected sometime during the period beginning at 6:00 p.m. EST Tuesday 2/13/01 and ending at 6:00 a.m. EST Wednesday 2/14/01. *QPF 12HR is forecast out to 60 hours.*
- k. **MAX QPF (optional).** The value for MAX QPF is the estimated maximum amount of precipitation, in inches, occurring at any point within the forecast area during the 12-hour period ending at 6:00 a.m. or 6:00 p.m. local time. This amount is presented as either a single value or a range, and is based upon a 75% confidence level of the QPF forecaster(s). MAX QPF is right justified below the hour defining the ending time of the expected precipitation, and is *available out to 60 hours.*
- l. **SNOW 12HR.** The expected range of total snowfall accumulation (in whole inches) forecast to occur in the forecast area during a 12-hour period ending at

6:00 a.m. or 6:00 p.m. local time. SNOW 12HR will only appear during the locally defined winter period. The snow parameter contains 1 to 5 alphanumeric characters which are right justified in the column below the hour defining the *ending time* of the precipitation period. SNOW 12HR may appear as a one or two digit number (1, 4, 12), or as a specified range (2-4, 8-12). When no snowfall is forecast during the locally specified winter period, double zeros (00-00) will appear in the row. Snowfall that is not measurable (less than 0.1 inch of frozen precipitation) is referred to as a trace. A trace of snow is depicted by a "T." *SNOW 12HR is forecast out to 36 hours.*

- m. **PRECIPITATION TYPE AND CATEGORY.** The AFM may list several types of precipitation. Precipitation types only appear in the AFM if they are forecast to occur in the specified area during the seven day forecast. Precipitation type codes are listed in the far left column of the AFM. For each type of precipitation that is forecast, an associated POP category is specified within the body of the product. During the first 60 hours, the POP category for the indicated precipitation type is a snapshot valid at the hour specified by the column header. Beyond 60 hours through Day 7, the POP category reflects the prevailing POP during the 6-hour period including and preceding the hour indicated at the top of the column. PTYPE and Category is available at *3-hr projections out to 60 hours, then for 6-hour periods beyond 60 hours through Day 7.* The types of precipitation that may be forecast in the AFM are shown in Table 3.

AFM Code	Sensible Weather
RAIN	Rain
RAIN SHWRS	Rain Showers
SPRINKLES	Sprinkles
TSTMS	Thunderstorms
DRIZZLE	Drizzle
SNOW	Snow, Snow Grains/Pellets
SNOWSHWRS	Snow Showers
FLURRIES	Snow Flurries
SLEET	Ice Pellets
FRZG RAIN	Freezing Rain
FRZG DRZL	Freezing Drizzle

**Table 3.** AFM Sensible Weather Codes.

Probability of Precipitation and Areal Coverage codes appearing in the AFM are shown in Table 4, along with their equivalent POP or areal coverage in percent.

AFM Code	Qualifying Term (Stratiform or Convective)	POP (%)
S	Slight Chance	(> 0 and ≤ 20%)
C	Chance	(30%-50%)
L	Likely	(60%-70%)
O	Occasional/Periods of	(80%-100%)
D	None	(80%-100%)
AFM Code	Areal Term (Convective)	Areal Coverage (%)
IS	Isolated	(≤ 20%)
SC	Scattered	(30%-50%)
NM	Numerous	(60%-70%)
EC	None (extensive coverage)	(80%-100%)
AFM Code	Areal Term (Non-Measurable Stratiform)	Areal Coverage (%)
PA	Patchy	(<25%)
AR	Areas	(25>50%)
WD	Widespread	(>50%)

**Table 4.** AFM POP and Areal Coverage Codes.

In Figure 3, snapshots of the forecast reveal RAIN is likely (indicated by an “L”) at midnight, 3:00 a.m., and 6:00 a.m. EST WED 02/14/01. This implies that rain is likely during that entire period. Thereafter, the code “C” implies a chance of rain from about 9:00 a.m. until 12 noon on 02/14/01. In contrast, on Monday 2/12/01 no precipitation is forecast, so probability codes are not listed.

*Precipitation categories are snapshots available at 3-hour projections out to 60 hours, then averaged over 6-hour intervals out to Day 7.*

- n. **OBVIS.** If an obstruction to visibility (OBVIS) is predicted for the forecast area, a row labeled OBVIS will be listed underneath any forecast of precipitation. If no precipitation is forecast, then OBVIS will be listed under the row labeled CLOUDS. In Figure 2, “K” indicates smoke is forecast to restrict visibility at 6:00 a.m. and 9:00 a.m. EST on Monday 2/12/01. *OBVIS is a snapshot available at 3-hour projections through 60 hours.* The complete AFM OBVIS code list and associated definitions are shown in Table 5.

AFM Code	Obstruction to Visibility
F	Fog

PF	Patchy Fog
F+	Dense Fog
PF+	Patchy Dense Fog
H	Haze
BS	Blowing Snow
K	Smoke
BD	Blowing Dust
AF	Volcanic Ashfall

**Table 5.** AFM Obstruction to Visibility Codes.

- o. WIND CHILL and HEAT INDEX. Wind Chill and Heat Index are included seasonally based upon locally defined criteria. The decision on whether to include or exclude these parameters is determined by the local WFO criteria. *WIND CHILL and HEAT INDEX are snapshots at the indicated hour and are forecast at 3-hour projections out to 60 hours.*
- p. MIN CHILL and MAX HEAT. When WIND CHILL or HEAT INDEX values appear in the AFM, a 6-hour minimum wind chill or maximum heat index may appear on the following row. These values indicate the minimum wind chill/maximum heat index forecast to occur during the 6-hour period (inclusive of, and preceding) the hour indicated at the top of the column. *MIN CHILL and MAX HEAT are included at 6-hr intervals out to 60 hours.*
- q. WATCH, WARNING and ADVISORY. When Valid Time Event Codes (VTEC) as described in NWS Directive 10-1703 becomes available, long duration hazardous weather events will be included when a valid WATCH, WARNING and/or ADVISORY is issued by a WFO. The weather phenomena codes are decoded into plain language from VTEC and will appear as labels for additional rows at the bottom of the 3HRLY block. Within the text of the AFM, the VTEC codes for WATCH [A], WARNING [W], and ADVISORY [Y] will appear if the valid time of the event is in effect during the indicated hour. For example, in Figure 6, the “A” symbol indicates that during the snapshot times of 3:00 p.m. and 6:00 p.m. EST on February 13, 2001 a High Wind Watch is in effect. *If forecast, these codes will only appear during the first 60 hours.*

3.3.4.3 Special Instructions for Tropical Cyclones. Due to the uncertainty in the location and intensity of tropical cyclones, special instructions will apply to AFM entries for wind speed, wind direction and wind gusts for various time periods as described in the following sections and Table 6.

- a. Zero to 24 Hours. If forecast winds for a specified land area meet or exceed hurricane force (i.e., 64 kts or 74 mph) within the first 24 hours, the AFM will portray wind direction (WIND DIR) to the 8 points of a compass, deterministic

wind speed (WIND SPD), and deterministic wind gusts (WIND GUST) as shown in Table 6.

- b. Beyond 24 Hours. If the potential exists for winds in a specified land area to meet or exceed hurricane force beyond 24 hours, the AFM will portray wind direction, and wind speed using the code “**HU**” in lieu of the deterministic winds (beyond 24 to 60 hours), and in lieu of the predominant wind direction (PWIND DIR) and wind character codes (beyond 60 hours to 120 hours). The code “**HG**” will appear in the AFM to indicate hurricane force wind gusts are possible. HG will be portrayed in lieu of the deterministic wind gusts beyond 24 hours to 60 hours only (see Table 6). Both the HU and HG codes indicate hurricane force winds, or wind gusts respectively, *could* occur. Users should refer to the tropical cyclone center or local WFO for the latest details concerning the storm.

Forecast Period (Hours)	Wind Direction (8 pts. of Compass)	Sustained Wind Speed (MPH)	Wind Gusts (MPH)
0 to 24	N, NE, E, SE, S, SW,W, or NW	Deterministic (e.g., 74 mph, 95 mph)	Deterministic (e.g., 115 mph)
> 24 to 60	HU (variable and uncertain)	HU (hurricane force possible)	HG (hurricane force possible)
>60 to 120 (Day 5)	HU (variable and uncertain)	HU (hurricane force possible)	N/A

**Table 6.** AFM entries for Hurricanes.

3.3.5 Format. The AFM is a segmented product automatically generated for individually defined areas in the format shown in Figure 3.

- a. Labels. Alphanumeric parameter labels describing the contents of each row are listed down the left hand edge of the product. Labels are composed of one or more words, but will not extend beyond the 12th character space from the left.
- b. Parameters. All parameters are right justified beneath the valid hour, or the end of the valid period to which they pertain. MAX/MIN is the only exception (see section 3.3.4.2, Part A for details). Although right justified, three precipitation categories may contain ranges comprising more than 2 or 3 characters. The categories and possible character spaces are as follows:
  - (1) QPF - maximum 9 characters (e.g., 1.00-1.50)
  - (2) MAX QPF - maximum 11 characters (e.g., .75 or 10.00-12.00)
  - (3) SNOW 12HR - maximum 5 characters (e.g., 12-18)
- c. Missing Data. Missing data within an otherwise complete AFM will be indicated by the code, “MM.”

	1	2	3	4	5	6	7	8																	
1234567890123456789012345678901234567890123456789012345678901234567890																									
Product Format					Description of Entry																				
FOaaii cccc ddhhmm					(WMO Heading)																				
AFMxxx					(AWIPS ID)																				
AREA FORECAST MATRICES					(MND - NWS Product Name)																				
NATIONAL WEATHER SERVICE city state					(Issuing Office)																				
400 AM MON FEB 12 2001					(Issuance Time/Date)																				
stZ###-###>###-ddhhmm-					(UGC Type: <u>Zone</u> )-(Exp. Time)																				
county st-county st					(Included County or Zone/State)																				
INCLUDING THE CITIES OF...city...city					(Included Cities within the Zone)																				
400 AM MON FEB 12 2001					(Issuance Time/Date)																				
DATE	MON 02/12/01				TUE 02/13/01				WED 02/14/01																
UTC 3HRLY	08	11	14	17	20	23	02	05	08	11	14	17	20	23	02	05	08	11	14	17	20	23			
EST 3HRLY	03	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	15	18			
MAX/MIN					48	36	38	39	50	53	55					45	49	50	52						
TEMP	33	39	45	46	45	43	41	39	41	45	49	50	49	49	50	48	46	47	47	49	47				
DEWPT	15	17	20	22	25	29	33	34	36	38	40	42	42	43	44	44	44	46	46	43	39				
RH	47	40	36	38	45	57	72	82	82	76	70	73	76	79	79	85	92	96	96	79	73				
WIND DIR	NW	NW	W	W	SW	SW	W	W	S	S	S	S	S	S	SW	SW	S	SE	SE	SE	SE				
WIND SPD	5	8	8	8	8	8	5	2	10	14	28	36	26	22	10	8	5	2	2	5	8				
WIND GUST									22	25	42	56	52	34	20										
CLOUDS	OV	OV	OV	OV	B1	B1	SC	B1	B1	B2	B2	B2	B2	OV	OV	OV	OV	OV	B2	B1	B1				
POP 12HR					10					10					20					70					50
QPF 12HR					0					0					0	.25-	.49					.10-	.24		
MAX QPF					0					0					0	.50-	.75					.25-	.50		
SNOW 12HR					00-00					00-00					00-00										
RAIN													S	S	C	L	L	L	C	C					
OBVIS	K		K														F	F	F	F	F				
WIND CHILL	30	30																							
MIN CHILL				24																					
HIGH WIND											A	A													
DATE	THU 02/15/01				FRI 02/16/01				SAT 02/17/01				SUN 02/18/01												
UTC 6HRLY	05	11	17	23	05	11	17	23	05	11	17	23	05	11	17	23									
EST 6HRLY	00	06	12	18	00	06	12	18	00	06	12	18	00	06	12	18									
MIN/MAX	35	46			34	41			24	33			18	30											
TEMP	41	39	44	43	40	36	39	34	29	24	29	26	22	19	28	24									
DEWPT	38	36	36	38	37	34	34	32	26	22	21	18	16	16	20	21									
PWIND DIR	SE		S		SW		NW		N				N		SE		SE								
WIND CHAR	LT		LT		LT		LT		BZ		WY		LT		LT										
AVG CLOUDS	B1	B2	OV	OV	B2	B1	B1	SC	FW	CL	CL	CL	FW	SC	SC										
POP 12HR	10	40			40	20			0	0			40	60											
RAIN					C		C								C		L	L							
RAIN SHWRS					SC		SC		SC																

Figure 3. Area Forecast Matrices Product Format - Early Morning Issuance.

3.4 Updates and Corrections. The AFM will be updated and corrected when the on-duty forecast team believes the current forecast is not representative, or when format or content errors are detected. When the AFM is updated, all forecast parameters prior to the update time (to the nearest 3-hour period) are removed from the product (See Figure 4). Occasionally, a forecast may need a correction. In these instances, the automated AFM product is replaced with the corrected version.

	1	2	3	4	5	6	7	8														
1234567890123456789012345678901234567890123456789012345678901234567890																						
Product Format					Description of Entry																	
FOaaii cccc ddhhmm AAA					(WMO Heading)																	
AFMxxx					(AWIPS ID)																	
AREA FORECAST MATRICES...UPDATED					(MND - NWS Product Name)																	
NATIONAL WEATHER SERVICE city state					(Issuing Office)																	
110 PM EST MON FEB 12 2001					(Issuance Time/Date)																	
stZ###-###>###-ddhhmm-					(UGC Type: Zone)-(Exp. Time)																	
county st-county st-county st					(Included County or Zone/State)																	
INCLUDING THE CITIES OF...city...city					(Included Cities within the Zone)																	
110 PM EST MON FEB 12 2001					(Issuance Time/Date)																	
DATE	MON 02/12/01				TUE 02/13/01				WED 02/14/01													
UTC 3HRLY	08	11	14	17	20	23	02	05	08	11	14	17	20	23	02	05	08	11	14	17	20	23
EST 3HRLY	03	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	15	18
MAX/MIN	48 36 38 39				50 53 55				45 49 50 52													
TEMP	46	45	43	41	39	41	45	49	50	49	49	50	48	46	47	47	49	47				
DEWPT	22	25	29	33	34	36	38	40	42	42	43	44	44	44	46	46	43	39				
RH	38	45	57	72	82	82	76	70	73	76	79	79	85	92	96	96	79	73				
WIND DIR	W	SW	SW	W	W	S	S	S	S	S	S	SW	SW	S	SE	SE	SE	SE				
WIND SPD	8	8	8	5	2	10	14	28	36	26	22	10	8	5	2	2	5	8				
WIND GUST					22 25 42 56 52 34 20																	
AVG CLOUDS	OV	B2	B1	SC	B1	B1	B1	B2	B1	OV	OV	OV	OV	OV	B2	B2	B2					
POP 12HR	10				10				20				70				50					
QPF 12HR	0				0				0				.25-.49				.10-.24					
MAX QPF	0				0				0				.25-.49				.10-.24					
SNOW 12HR	00-00				00-00				00-00													
RAIN									S S C				L L L C C									
OBVIS													F F F F F									
WIND CHILL																						
MIN CHILL																						
HIGH WIND									A A													
					etc...																	

Figure 4. Area Forecast Matrices Update Format.

4. **Coded Cities Forecast (product category CCF)**

4.1 Mission Connection. WFOs issue CCFs for both internal and external uses. CCFs are abbreviated forecasts for particular cities/locations within a WFO's area of responsibility. CCFs serve as input for the Selected Cities Weather Summary and Forecasts and Travelers' Forecasts. The private sector uses the CCF to compare with their forecasts for specific cities/locations.

4.2 Issuance Guidelines.

4.2.1 Creation Software. The CCFs may be generated automatically by software formatters, or composed manually using the AWIPS text editor or any other text editor.

4.2.2 Issuance Criteria. The CCF is a routine product issued twice daily by all WFOs.

4.2.3 Issuance Time. CCFs will be transmitted twice daily; in the morning (between 0700 UTC and 1000 UTC) and in the afternoon (between 1900 and 2200 UTC).

4.2.4 Valid Time. CCFs are valid according to the schedule shown in Table 7:

Issuance Time	Beginning	Ending
07-10 UTC, Daily	Today, 12 UTC	see Sect. 4.3.4
19-22 UTC, Daily	Tonight, 00 UTC	see Sect. 4.3.4

**Table 7.** CCF Issuance Schedule.

4.2.5 Product Expiration Time. Product expires with the next issuance.

4.3 Technical Description. CCFs will follow the format and content described in this section.

4.3.1 MND Broadcast Line. Not applicable.

4.3.2 MND Header. Not applicable.

4.3.3 Content. Each CCF will contain the following elements as shown in Table 8. Specific details on each element are described in the sections following the table.

Element	Meaning
LLL	Location Identifier
F <sub>i</sub> , where i= 1, 2, etc.	One-Word Daytime Forecast
T <sub>max</sub>	Maximum Temperature
T <sub>min</sub>	Minimum Temperature
NN	Forecaster Number
P <sub>i</sub> , where i= 1, 2, etc.	Probability of Precipitation

**Table 8.** CCF Elements and Meaning.

4.3.3.1 Location Identifier. LLL is a 3-character identifier for U.S. cities, airports, etc., and will be specifically listed in either the NWS or DOT/FAA Location Identifiers Handbooks.

4.3.3.2 One-Word Daytime Forecasts. F<sub>1</sub>, F<sub>2</sub>, F<sub>3</sub>, etc., are single letters which represent one-word daytime forecasts for the predominant weather expected during daylight hours. The list below gives the corresponding letters and weather elements.

U	SUNNY	L	DRZL (drizzle)
V	CLEAR	R	RAIN
A	FAIR	O	RNSNOW (mixed precipitation)

B	PTCLDY (partly cloudy)	S	SNOW
E	MOCLDY (mostly cloudy)	J	SNOSHWR (snow showers)
C	CLOUDY	M	FLRRYS (snow flurries)
G	VRYHOT (very hot or hot/humid)	P	BLZZRD (blizzard)
I	VRYCLD (very cold/wind chill)	Q	BLGSNO (blowing snow)
F	FOGGY	W	SHWRS (showers)
H	HAZE	T	TSTRMS (thunderstorms)
K	SMOKE	X	SLEET
D	DUST	Y	FZRAIN (freezing rain)
N	WINDY	Z	FZDRZL (freezing drizzle)

The break-out of the one-word forecasts depends on the issuance time:

Issuance Time (UTC)	Sequence	Represents Forecast For
07-10	F <sub>1</sub> F <sub>2</sub> F <sub>3</sub> , etc	Today, Day 2, Day 3, etc.
19-22	F <sub>1</sub> F <sub>2</sub> F <sub>3</sub> , etc	Tomorrow, Day 2, Day 3, etc.

**Table 9.** CCF Wording and Issuance Time.

4.3.3.3 Temperature Forecasts. A maximum and minimum temperature in degrees Fahrenheit are forecast for each forecast period. The maximum and minimum forecast periods are defined as 7:00 a.m. to 7:00 p.m. and 7:00 p.m. to 8:00 a.m. local standard time respectively. The temperatures are encoded with three digits. For example, 52 degrees is encoded 052, 112 degrees is encoded 112, 7 degrees is encoded 007, and zero degrees is encoded 000. Temperatures below zero are preceded by the digit "9." For example, -15 degrees is encoded 915, -5 degrees is encoded 905.

4.3.3.4 Forecaster Number. Two digits, represented by NN, in digits 01 through 99.

4.3.3.5 Probability of Precipitation (POP). A single code represents each 12-hour period of the CCF. For example:

Issuance Time (UTC)	Sequence	Forecast Periods (UTC)
07-10	P <sub>1</sub> P <sub>2</sub> P <sub>3</sub> P <sub>4</sub> , etc	Today (12-00), Tonight (00-12), Day 2 (12-00), Day 2 night (00-12), etc.
19-22	P <sub>1</sub> P <sub>2</sub> P <sub>3</sub> P <sub>4</sub> , etc	Tonight (00-12), Tomorrow (12-00), Tomorrow night (00-12), Day 2 (12-00), etc.

**Table 10.** Probability of Precipitation Issuance and Forecast Periods.

The POP Codes and their values are as follows:			
<u>Code</u>	<u>POP Value (%)</u>	<u>Code</u>	<u>POP Value (%)</u>
0	Near Zero	6	60
-	5	7	70
1	10	8	80

2	20	9	90
3	30	+	Near 100
4	40	/	Missing
5	50		

**Table 11.** POP Codes and Associated Values.

If the probability forecast is 50 percent or greater, the corresponding one-word forecast should normally be for a precipitation event. However, if there is a high POP that applies very early in the day, then a non-precipitation forecast would likely be the dominant forecast.

4.3.3.6 Snowfall Amount (optional). An optional entry indicating forecast snow amounts may be included.

Issuance Time (UTC)	Snowfall Range (inches)	Forecast Periods (UTC)
07-10	<i>aaaa/bbbb/cccc</i>	Today (12-00), Tonight (00-12), Day 2 (12-00)
19-22	<i>aaaa/bbbb/cccc</i>	Tonight (00-12), Tomorrow (12-00), Tomorrow Night (00-12)

**Table 12.** Snowfall Issuance Times and Forecast Periods.

4.3.4 Format. WFOs will transmit CCFs in the following prescribed format to ensure product utility by multiple users' computers. Note that the temperature forecasts have a different sequence depending on the transmission time. *Optional snowfall entry is indicated in italics.*

07-10 UTC Issuance – CCF Sequence
LLL F <sub>1</sub> F <sub>2</sub> max/min max/min max NNP <sub>1</sub> P <sub>2</sub> P <sub>3</sub> <i>aaaa/bbbb/cccc</i> F <sub>3</sub> F <sub>4</sub> F <sub>5</sub> F <sub>6</sub> F <sub>7</sub> min/max min/max min/max min/max P <sub>4</sub> P <sub>5</sub> P <sub>6</sub> P <sub>7</sub> P <sub>8</sub> P <sub>9</sub> P <sub>10</sub> P <sub>11</sub> P <sub>12</sub> P <sub>13</sub>

**Table 13.** IFPS Site Seven-Day 07-10 UTC Issuance CCF Format.

19-22 UTC Issuance – CCF Sequence
LLL F <sub>1</sub> F <sub>2</sub> min/max min/max min NNP <sub>1</sub> P <sub>2</sub> P <sub>3</sub> <i>aaaa/bbbb/cccc</i> F <sub>3</sub> F <sub>4</sub> F <sub>5</sub> F <sub>6</sub> F <sub>7</sub> max/min max/min max/min max/min max P <sub>4</sub> P <sub>5</sub> P <sub>6</sub> P <sub>7</sub> P <sub>8</sub> P <sub>9</sub> P <sub>10</sub> P <sub>11</sub> P <sub>12</sub> P <sub>13</sub> P <sub>14</sub>

**Table 14.** IFPS Site Seven-Day 19-22 UTC Issuance CCF Format.

Example CCF Message. An IFPS formatted CCF message is shown below.

FPUS41 KBOX 121953  
CCFBOX

BOS AB 057/070 055/077 053 13001

CAABA 063/055 066/050 067/051 074/057 066 29440000442  
next city...

Description: This is a 7-day CCF for BOS (Boston, MA), transmitted at 1953 UTC. Decoding follows the format specified above for the 'afternoon' CCF. The line one decoding process is already addressed and is not repeated here. {Note: No entry for optional snowfall forecast following the forecaster number and POP entry (13001). This can be either empty or indicated by 0000/0000/0000.}

Line two, highlighted, starts the expanded coded forecast for Days 3-7. The first five letters represent the one-word forecast for daylight hours. The decoding is as follows: the forecast for Day 3 is cloudy (C), Days 4, 5 and 7, is mostly sunny (A) and Day 6 is partly cloudy (B). The next several numbers are maximum/minimum temperatures for each day. In this example the forecast highs for Days 3-7 are: 63°F, 66°F, 67°F, 74°F and 66°F. The forecast lows for Days 4-7 are: 55°F, 50°F, 51°F, and 66°F. The final series of numbers are 12-hour forecast POPs: the POP for Day 2 (12-00 UTC) is 20% (2); Day 2 night (00-12 UTC) is 90% (9); Day 3 (12-00 UTC) is 40% (4); Day 3 night (00-12 UTC) is 40% (4); Day 4 (12-00 UTC) is near 0% (0); Day 4 night (00-12 UTC) is near 0% (0); Day 5 (12-00 UTC) is near 0% (0); Day 5 night (00-12 UTC) is near 0% (0); Day 6 (12-00 UTC) is 40 percent (4); Day 6 night (00-12 UTC) is 40% (4); and Day 7 (12-00 UTC) is 20% (2).

4.4 Updates and Corrections. CCFs will be updated and corrected between routine issuances when the on-duty forecast team believes the current CCF is not representative, or a typographical/format error is detected.

## 5. Point Forecast Matrices (product category PFM).

5.1 Mission Connection. The Point Forecast Matrices (PFM) product displays various forecasted weather parameters for verification points, significant cities, and any other pre-defined points within a WFO's geographic area of responsibility. Forecasts for these parameters are at 3-hour, 6-hour, and/or 12-hour intervals. The PFM is intended for use by large volume users of NWS forecast information and for use by the general public. The quasi-static matrix format of the PFM allows for rapid visual scanning of a large number of forecast parameters/values. In addition, the forecast data is decodable by computers for those who wish to create derived products. Information in the PFM is provided to users as supplemental detail and/or higher resolution detail than can be found in other standard NWS products. Through the PFM product, the NWS strives to improve communications to the public and hazards community, increase forecast resolution, provide users with information on which they can base their decisions, and increase forecast and warning accessibility.

### 5.2 Issuance Guidelines.

5.2.1 Creation Software This product is created using the IFPS software.

5.2.2 Issuance Criteria. The PFM is a dynamic product issued by all WFOs for each of their verification points, significant cities and other locally defined locations within their geographic area of responsibility. The PFM should be issued whenever necessary to always depict the latest expected weather conditions at the specified point through Day 7.

5.2.3 Issuance Time. The PFM is an event-driven product and may be issued at any time. However, at a minimum the PFM will be issued twice daily to remove the outdated first period of the forecast. These mandatory issuance times will occur no later than 4:00 a.m. and 4:00 p.m. local time with one exception. During a tropical cyclone event, WFOs may delay the morning and/or afternoon issuance of the PFM until after the Tropical Prediction Center issues its advisories. In these circumstances, the PFM should be issued as soon as reasonably possible, and no later than 1.5 hours after receiving the TPC message.

5.2.4 Valid Time. The PFM is valid from the time of release through Day 7.

5.2.5 Product Expiration Time. The PFM product expires upon reaching the next mandatory issuance time.

5.3 Technical Description. PFMs should follow the format and content described in the following section.

5.3.1 UGC Type. The PFM product will use the (Z) form of the UGC to identify the zone in which the specified point resides. A latitude/longitude line is included in the product to identify the specified point location.

5.3.2 MND Broadcast Instruction Line. PFMs do not contain an MND Broadcast Instruction Line.

5.3.3 MND Product Type Line. The Point Forecast Matrices MND line is, "POINT FORECAST MATRICES."

5.3.4 Content. The following section describes the detailed content of the PFM product.

5.3.4.1 Date/Time Block. Below the product issuance time/date, the forecast date and time blocks will be displayed. The day of the week will be expressed by the standard 3-letter identifiers (SUN, MON, TUE, WED, THU, FRI, SAT) followed by the month, day and year (MM/DD/YY). The day and date labels are left justified above the 6:00 a.m. local time hour.

The following two lines provide the forecast times at 3 hour intervals (indicated by 3HRLY) out to 60 hours (2 ½ days) into the future. Listed on the far left of the time lines, the 3-letter codes (e.g., UTC, EST etc.) identify the time expression. The Universal Time Coordinate (UTC) will always be listed on the first line, followed by the local time for the area covered by the PFM. In this example, the "EST 3HRLY" indicates the time zone is Eastern Standard Time (EST), and the minimum forecast interval for any parameter is 3 hours.

The second block is valid from 66 hours through Day 7. Once again, the local time zone is EST, but the time interval is no longer 3 hours. Forecast parameters are valid for time intervals of at least 6 hours (indicated by 6HRLY), otherwise for 12 hours (See Figures 5 and 6).

DATE	MON 02/12/01					TUE 02/13/01					WED 02/14/01											
UTC 3HRLY	08	11	14	17	20	23	02	05	08	11	14	17	20	23	02	05	08	11	14	17	20	23
EST 3HRLY	03	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	15	18
DATE	THU 02/15/01				FRI 02/16/01				SAT 02/17/01				SUN 02/18/01									
UTC 6HRLY	05	11	17	23	05	11	17	23	05	11	17	23	05	11	17	23	05					
EST 6HRLY	00	06	12	18	00	06	12	18	00	06	12	18	00	06	12	18	00					

Figure 5. PFM Date/Time Block.

5.3.4.2 Forecast Parameters. The following PFM forecast parameters are listed in order of their appearance within the product. Most elements are valid at the top of the hour indicated and then applied to the following 59 minutes. Elements valid for multiple hours (e.g., QPF, PoP, AVG CLOUDS) are referenced by the hour the forecast period ends. Precipitation Type parameters are independent and only appear in the 3HRLY and/or 6HRLY blocks when forecast. Other elements such as Wind Chill and Heat Index are seasonal as defined by the local office. Watch, Warning, and Advisory information will also appear only when forecast.

- a. MAX/MIN. (*Alternatively labeled as MIN/MAX for afternoon issuance*)  
A forecast of maximum or minimum temperatures in degrees Fahrenheit (°F). The MAX temperature is valid for the period 7:00 a.m. through 7:00 p.m. local standard time, and “MIN” is valid for 7:00 p.m. through 8:00 a.m. local standard time (note that due to a 3-hour minimum time resolution, this element is right justified in the column beneath the *approximate* ending time of the MAX/MIN period). The nighttime MIN and daytime MAX are displayed as a single integer comprising 3 character spaces or less (e.g., -2, 8, 53, 102). For example, in Figure 6 the MIN temperature forecast for Tuesday night 2/13/01 is 45 degrees Fahrenheit. *MAX/MIN is forecast out through Day 7.*
- b. TEMP. TEMP is a snapshot of the expected temperature in degrees F valid at the specified point at the indicated hour. The temperature is right justified in the column below the hour to which it refers. For example, in Figure 6 the forecasted temperature for 6:00 a.m. EST Wednesday 02/14/01 is 46 degrees F. *TEMP is available at 3-hour projections through 60 hours, then 6-hour projections through Day 7.*
- c. DEWPT. DEWPT is a snapshot of the expected dew point temperature in degrees F for the same time periods as its corresponding temperature forecast. DEWPT is located directly below the temperature line.
- d. RH. The relative humidity (RH) is a snapshot of the expected RH for the same time periods as its corresponding temperature and dew point forecast. The RH row is located directly below the “DEWPT” row. For example, in Figure 6 the RH at 3:00 p.m. (1500 hours) on 02/12/01 is based on a temperature of 46 degrees F and a dew point of 22 degrees F. The RH is 38%. *RH is available at 3-hour projections through 60 hours.*
- e. WIND DIR. WIND DIR is a snapshot of the expected wind direction forecast to occur at the indicated hour, using the 8 points of a compass (i.e., N, NE, E, SE, S, SW, W, NW). For example, in Figure 6 the forecasted prevailing wind direction,

i.e., the direction from which the wind is blowing, at 9:00 a.m. EST Monday 02/12/01 is Northwest (NW). If a calm wind is forecast, double zeros (00) will be listed in place of a wind direction. WIND DIR is located below the hour to which it refers. *WIND DIR is available at 3-hour projections out to 60 hours.* (Note special exception to wind direction for hurricanes in section 5.3.4.3.)

In the 6HRLY block, **PWIND DIR** is the “predominant” wind direction at the point during the 12-hour period between 6:00 a.m. and 6:00 p.m., or 6:00 p.m. and 6:00 a.m. local time. *PWIND DIR is available beyond 60 hours through Day 7.*

- f. WIND SPD. WIND SPD is a snapshot of the sustained wind speed in miles per hour (MPH) forecast to occur at the indicated hour through 60 hours. For example, in Figure 6 the forecasted wind speed at 3:00 p.m. (1500 hours) EST Tuesday 02/13/01 is 36 MPH. If a calm wind is forecast, double zeros (00) will be listed in place of a wind speed. (Note special exception to wind speed for hurricanes in section 5.3.4.3.) *WIND SPD is available at 3-hour projections out to 60 hours.*

WIND CHAR codes are used beyond 60 hours through Day 7 of the forecast and denote the character of the wind for the specified point during the 12-hour period between 6:00 a.m. and 6:00 p.m., or 6:00 p.m. and 6:00 a.m. local time. WIND CHAR is comprised of range categories used in conjunction with deterministic wind speeds. Each range category is equated to a descriptive wind term, i.e., a “wind character” to best describe the MAXIMUM SUSTAINED wind speed during the period. For example, in Figure 6, on Saturday 02/17/01 during the 12-hour period between 6:00 a.m. and 6:00 p.m., the PFM code “WY” indicates that the period is expected to be “WINDY” with maximum (sustained) speeds in the range of 23 to 30 mph. See Table 15 for the full list of PFM wind categories.

Wind Character Codes	Wind Character	12-hr Maximum Sustained Wind Speed
LT	Light	< 8 mph
GN	Gentle	8 - 14 mph
BZ	Breezy	15 - 22 mph
WY	Windy	23 - 30 mph
VW	Very Windy	31 - 39 mph
SD	Strong/Damaging	≥ 40 mph

**Table 15.** PFM Wind Character Codes.

- g. WIND GUST. A wind gust row will appear in the 3HRLY block whenever forecasted wind gusts exceed the sustained wind speed (WIND SPD) by at least 10 MPH. WIND GUST is a snapshot valid on the hour indicated at the top of the

corresponding column. For example, in Figure 6, the maximum wind gust at 6:00 p.m. (1800 hours) EST Tuesday 02/13/01 is forecast to be 52 MPH. *WIND GUST is a snapshot of gusts of wind occurring at the indicated hour and is available at 3-hour projections through 60 hours.* (Note special exception to wind gust in reference to hurricanes in section 5.3.4.3.)

- h. **CLOUDS.** The CLOUDS category provides a snapshot of sky coverage during the indicated hour. CLOUDS is divided into five category codes ranging from clear to overcast . Each code represents an equivalent percentage of opaque sky cover in percent. *CLOUDS parameter is included at 3-hour projections out to 60 hours.* In the 6HOURLY section, AVG CLOUDS is valid for 6-hour intervals beyond 60 hours through Day 7 and denotes the average amount of all opaque clouds during the 6-hour period ending on the hour indicated at the top of the column. The complete cloud codes and equivalent sky cover definitions are shown in Table 16.

PFM Sky Cover Code	Predominant Sky Cover (Opaque Cloud Coverage in Percent)	Equivalent Sky Cover Expressions
CL	0% to, $\leq 5\%$	SUNNY or CLEAR
FW	$> 5\%$ and $\leq 25\%$	SUNNY or MOSTLY CLEAR
SC	$> 25\%$ and $\leq 50\%$	MOSTLY SUNNY or PARTLY CLOUDY
B1	$> 50\%$ and $\leq 69\%$	PARTLY SUNNY or MOSTLY CLOUDY
B2	$> 69\%$ and $\leq 87\%$	MOSTLY CLOUDY or CONSIDERABLE CLOUDINESS
OV	$> 87\%$ and 100%	CLOUDY or OVERCAST

**Table 16.** PFM Sky Cover Codes.

- i. **POP 12HR.** Probability of Precipitation (POP), is defined as the likelihood, expressed as a percent, of a measurable precipitation event (1/100th of an inch) at the specific PFM point. The “12HR” refers to the 12-hour valid time ending at 6:00 a.m. or 6:00 p.m. local time (0600 or 1800). The POP 12HR values that may appear in the PFM are as follows: 0, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100. These values are right justified in the column beneath the hour defining the ending time of the valid period. In Figure 6, there is a 70% chance of precipitation during the 12-hour period between 6:00 p.m. EST Tuesday 02/13/01 and 6:00 a.m. EST 2/14/01. *POP 12HR is forecast through Day 7.*
- j. **QPF 12HR.** This parameter, quantitative precipitation forecast (QPF) represents the total amount of liquid precipitation, in inches, expected at the specific point during a 12-hour period ending at 6:00 a.m., or 6:00 p.m. local time. The QPF is presented in locally defined ranges, (e.g., .10-.24), or single values. The QPF 12HR value is right justified in the column beneath the hour defining the ending time of the expected precipitation. For example, in Figure 6, the QPF 12HR

indicates that a total of .25-.49 inches of precipitation is expected sometime during the period beginning at 6:00 p.m. EST Tuesday 2/13/01 and ending by 6:00 a.m. EST Wednesday 2/14/01. *QPF 12HR is forecast out to 60 hours.*

- k. **SNOW 12HR.** The expected range of total snowfall accumulation (in whole inches) forecast to occur at the specific point during a 12-hour period ending at 6:00 a.m. or 6:00 p.m. local time. SNOW 12HR will only appear during the locally defined winter period. The snow parameter contains 1 to 5 alphanumeric characters which are right justified in the column below the hour defining the *ending time* of the precipitation period. SNOW 12HR may appear as a one or two digit number (1, 4, 12), or as a specified range (2-4, 8-12). When no snowfall is forecast during the locally specified winter period, double zeros (00-00) will appear in the row. Snowfall that is not measurable (less than 0.1 inch of frozen precipitation) is referred to as a trace. A trace of snow is depicted by a "T." *SNOW 12HR is forecast out to 36 hours.*
  
- l. **PRECIPITATION TYPE AND CATEGORY.** The PFM may list several types of precipitation. Precipitation types only appear in the PFM if they are forecast to occur *at the specified point during the seven day forecast.* Precipitation type codes are listed in the far left column of the PFM. For each type of precipitation that is forecast, an associated POP category is specified within the body of the product. Beyond 60 hours through Day 7, the POP category reflects the prevailing POP during the 6-hour period including and preceding the hour indicated at the top of the column. PTYPE and Category is available at *3-hr projections out to 60 hours, then for 6-hour periods beyond 60 hours through Day 7.* The types of precipitation that may be forecast in the PFM are shown in Table 17.

<b>PFM Code</b>	<b>Sensible Weather</b>
RAIN	Rain
RAIN SHWRS	Rain Showers
SPRINKLES	Sprinkles
TSTMS	Thunderstorms
DRIZZLE	Drizzle
SNOW	Snow, Snow Grains/Pellets
SNOWSHWRS	Snow Showers
FLURRIES	Snow Flurries
SLEET	Ice Pellets
FRZG RAIN	Freezing Rain
FRZG DRZL	Freezing Drizzle

**Table 17.** PFM Sensible Weather Codes.

Probability of precipitation codes and their equivalent POP definitions are shown in Table 18 below.

PFM Code	Qualifying Term (Stratiform or Convective)	POP (%)
S	Slight Chance	(> 0 and ≤ 20%)
C	Chance	(30%-50%)
L	Likely	(60%-70%)
O	Occasional/Periods of	(80%-100%)
D	None	(80%-100%)

**Table 18.** PFM Probability of Precipitation Codes.

In Figure 6, snapshots of the forecast reveal RAIN is likely (indicated by an “L”) at midnight, 3:00 a.m., and 6:00 a.m. EST WED 02/14/01. This implies that rain is likely during that entire period. Thereafter, the code “C” implies a chance of rain from about 9:00 a.m. until 12 noon on 02/14/01. In contrast, on Monday 2/12/01 no precipitation is forecast, so probability codes are not listed.

*Precipitation categories are snapshots available at 3-hour projections out to 60 hours, then averaged over 6-hour intervals out to Day 7.*

- m. **OBVIS.** If an obstruction to visibility (OBVIS) is forecast at the specific point, a row labeled OBVIS will be listed underneath any forecast of precipitation. If no precipitation is forecast, then OBVIS will be listed under the row labeled CLOUDS. In Figure 6, “K” indicates smoke is forecast to restrict visibility at 6:00 a.m. and 9:00 a.m. EST on Monday 2/12/01. *OBVIS is a snapshot available at 3-hour projections through 60 hours.* The complete PFM OBVIS code list and associated definitions are shown in Table 19.

PFM Code	Obstruction to Visibility
F	Fog
PF	Patchy Fog
F+	Dense Fog
PF+	Patchy Dense Fog
H	Haze
BS	Blowing Snow
K	Smoke
BD	Blowing Dust

AF	Volcanic Ashfall
----	------------------

**Table 19.** PFM Obstruction to Visibility Codes.

- n. WIND CHILL and HEAT INDEX. Wind Chill and Heat Index are included seasonally based upon locally defined criteria. The decision on whether to include or exclude these parameters is determined by the local WFO criteria. *WIND CHILL and HEAT INDEX are snapshots at the indicated hour and are forecast at 3-hour intervals out to 60 hours.*
- o. MIN CHILL and MAX HEAT. When WIND CHILL or HEAT INDEX values appear in the PFM, a 6-hour minimum wind chill or maximum heat index may appear on the following row. These values indicate the minimum wind chill/maximum heat index forecast to occur during the 6-hour period (inclusive of, and preceding) the hour indicated at the top of the column. *MIN CHILL and MAX HEAT are included at 6-hr intervals out to 60 hours.*
- p. WATCH, WARNING and ADVISORY. When Valid Time Event Codes (VTEC) as described in NWS Directive 10-1703 becomes available, long duration hazardous weather events will be included when a valid WATCH, WARNING and/or ADVISORY is issued by a WFO. The weather phenomena codes are decoded into plain language from VTEC and will appear as labels for additional rows at the bottom of the 3HRLY block. Within the text of the PFM, the VTEC codes for WATCH [A], WARNING [W], and ADVISORY [Y] will appear if the valid time of the event is in effect during the indicated hour. For example, in Figure 6, the “A” symbol indicates that during the snapshot times of 3:00 p.m. and 6:00 p.m. EST on February 13, 2001 a High Wind Watch is in effect. *If forecast, these codes will only appear during the first 60 hours.*

5.3.4.3 Special Instructions for Hurricanes. Due to the uncertainty in the location and intensity of tropical cyclones, special instructions will apply to PFM entries for wind speed, wind direction and wind gusts for various time periods. Refer to AFM section 3.3.4.3 and Table 6 for details.

5.3.5 Format. The PFM is a segmented product automatically generated for individual point locations in the format shown in Figure 6.

- a. Labels. Alphanumeric parameter labels describing the contents of each row are listed down the left hand edge of the product. Labels are composed of one or more words, but will not extend beyond the 12th character space from the left.
- b. Parameters. All parameters are right justified beneath the valid hour, or the end of the valid period to which they pertain. MAX/MIN is the only exception (see section 5.3.4.2, part a for details). Although right justified, two precipitation categories may contain ranges comprising more than 2 or 3 characters. The categories and possible character spaces are as follows:

- (1) QPF - maximum 9 characters (e.g., 1.00-1.50)

(2) SNOW 12HR- maximum 5 characters (e.g., 12-18)

c. Missing Data. Missing data within an otherwise complete PFM will be indicated by the code, "MM."

1	2	3	4	5	6	7	8																							
12345678901234567890123456789012345678901234567890123456789012345678901234567890																														
Product Format FOaaii cccc ddhhmm PFMxxx				Description of Entry <i>(WMO Heading)</i> <i>(AWIPS ID)</i>																										
POINT FORECAST MATRICES NATIONAL WEATHER SERVICE city state 400 AM EST MON FEB 12 2001				<i>(MND - NWS Product Name)</i> <i>(Issuing Office)</i> <i>(Issuance Time/Date)</i>																										
stZ###-ddhhmm- point location-county st 11.11d 111.11d 400 AM EST MON FEB 12 2001				<i>(UGC Type: Zone)-(Exp. Time)</i> <i>(Plain language Location-County St)</i> <i>(Point latitude &amp; longitude)</i> <i>(Issuance Time/Date)</i>																										
DATE	MON 02/12/01						TUE 02/13/01						WED 02/14/01																	
UTC 3HRLY	08	11	14	17	20	23	02	05	08	11	14	17	20	23	02	05	08	11	14	17	20	23								
EST 3HRLY	03	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	15	18								
MAX/MIN	47						38						52						45						52					
TEMP	33	39	45	46	45	43	41	39	41	45	49	50	49	49	50	48	46	47	47	49	47									
DEWPT	15	17	20	22	25	29	33	34	36	38	40	42	42	43	44	44	44	46	46	43	39									
RH	47	40	36	38	45	57	72	82	82	76	70	73	76	79	79	85	92	96	96	79	73									
WIND DIR	NW	NW	W	W	SW	SW	W	W	S	S	S	S	S	S	SW	SW	S	SE	SE	SE	SE									
WIND SPD	5	8	8	8	8	8	5	2	10	14	28	36	26	22	10	8	5	2	2	5	8									
WIND GUST							22 25 42 56 52 34 20																							
CLOUDS	OV	OV	OV	OV	B2	B1	SC	B1	B1	B2	B2	B2	OV	OV	OV	OV	OV	OV	B1	B1	B2									
POP 12HR	5						10						20						70						50					
QPF 12HR	0						0						0						.25-.49						.10-.24					
SNOW 12HR	00-00						00-00						00-00																	
RAIN													S S C						L L L C C											
OBVIS	K K												F F F F F																	
WIND CHILL	30 30																													
MIN CHILL	24																													
HIGH WIND													A A																	
DATE	THU 02/15/01						FRI 02/16/01						SAT 02/17/01						SUN 02/18/01											
UTC 6HRLY	05	11	17	23	05	11	17	23	05	11	17	23	05	11	17	23	05	11	17	23										
EST 6HRLY	00	06	12	18	00	06	12	18	00	06	12	18	00	06	12	18	00	06	12	18										
MIN/MAX	35 46						34 41						24 33						18 30											
TEMP	41	39	44	43	40	36	39	34	29	24	29	26	22	19	28	24														
DEWPT	38	36	36	38	37	34	34	32	26	22	21	18	16	16	20	21														
PWIND DIR	SE S						SW NW						N N						SE SE											
WIND CHAR	LT LT						LT LT						BZ WY						LT LT											
AVG CLOUDS	B1 B2 OV OV						B2 B2 B1 SC						FW CL CL CL						FW SC SC											
POP 12HR	10 40						40 20						0 0						40 60											
RAIN	C C																		C L L											
RAIN SHWRS							C C S																							
\$\$																														

Figure 6. Point Forecast Matrices - Early Morning Issuance.

5.4 Updates and Corrections. The PFM will be updated and corrected when the on-duty forecast team believes the current forecast is not representative, or when format or content errors

are detected. When the PFM is updated, all forecast parameters prior to the update time (to the nearest 3-hour period) are removed from the product. Occasionally, a forecast may need a correction. In these instances, the automated PFM product is replaced with the corrected version.

6. **Recreation Report (product category REC).**

6.1 Mission Connection. The Recreation Report (REC) relays reports on conditions for resorts and recreational areas. This report, which may also contain forecast information, is for the general public.

6.2 Issuance Guidelines.

6.2.1 Creation Software. The REC may be composed using the AWIPS text editor or any other text editor.

6.2.2 Issuance Criteria. The REC does not have mandatory issuance criteria. Issuance criteria should be determined based upon user needs.

6.2.3 Issuance Time. The REC is a non-scheduled product issued on an as needed basis. Release times should be determined locally based upon user needs.

6.2.4 Valid Time. RECs are valid from the time of release until the next issuance.

6.2.5 Product Expiration Time. The REC product expiration time is determined locally.

6.2.6 Event Expiration Time. Not applicable.

6.3 Technical Description.

6.3.1 UGC Type. The REC may use Zone coding or descriptive geographic terminology, as appropriate.

6.3.2 MND Broadcast Instruction Line. The REC does not contain an MND Broadcast Instruction Line.

6.3.3 MND Product Type Line. The REC does not have a mandatory MND. The MND should be descriptive in nature and determined based upon user needs.

6.3.4 Content. The REC may contain the entire range of meteorological variables, e.g., sky cover, weather, wind, temperature, snow depth, tides, water temperature, etc. Specific content should be determined based upon user needs.

6.3.5 Format. The REC is a free-form text product.

SXaaii cccc ddhhmm	<i>(WMO Heading)</i>
RECxxx	<i>(AWIPS ID)</i>
stZ.....	<i>(UGC:Zone, if applicable)</i>
RECREATION FORECAST (or similar)	<i>(MND)</i>
NATIONAL WEATHER SERVICE city st	<i>(Issuing Office)</i>
time am/pm time_zone day mmm dd yyyy	<i>(Issuing time and date)</i>
[TEXT]	
\$\$	<i>(UGC Delimiter)</i>
Name/Initials/Fcstr ID	<i>(Optional)</i>

**Figure 7.** Recreational Forecast Generic Format.

6.4 Updates and Corrections. Corrections are issued as required. Updates are issued based upon user needs.

**7. State Forecast Product (product category SFP).**

7.1 Mission Connection. The SFP is a general 5 day public forecast of hydrometeorological conditions across the state (or part of the state) in which a WFO resides. The forecast area typically includes an entire state or part of one or more states. The SFP uses the discrete period format and is utilized by a wide variety of users such as the media, emergency managers, and the general public.

7.2 Issuance Guidelines.

7.2.1 Creation Software. The designated WFO should use the AWIPS text editor or other text editors to generate the SFP.

7.2.2 Issuance Criteria. The SFP is a routine product that may be issued twice daily in addition to the Tabular State Forecast Product (SFT).

7.2.3 Issuance Time. The SFP should be issued within 1-hour following the mandatory ZFP releases.

7.2.4 Valid Time. The SFP is valid from the time of release through Day 5.

7.2.5 Product Expiration Time. The SFP expires upon reaching the next mandatory issuance time.

7.3 Technical Description. The SFP is defined by the format and content described in this section.

7.3.1 UGC Type. The State Forecast Product will use the (Z) form of the UGC.

7.3.2 MND Broadcast Instruction Line. Not applicable.

7.3.3 MND Product Type Line. The MND line is “STATE FORECAST FOR [state or part of state].”

7.3.4 Format. The SFP should be in the discrete period format and use appropriate UGC containing public zones. For the morning issuance, the periods begin with ".TODAY...". The morning issuance contains three 12-hour periods followed by three 24-hour periods. The evening issuance periods begin with ".TONIGHT...". Evening forecasts contain four 12-hour periods followed by three 24-hour periods.

There are two available formats for the SFP: a product with only one geographic forecast segment, and a product containing two or more geographic forecast segments. At regional discretion, offices may use either format to provide the clearest and most understandable depiction of the forecast conditions.

7.3.4.1 Combining Periods. The first period of the SFP must stand alone. All other forecast periods may be combined when weather elements are similar (as regionally defined).

7.3.4.2 One Geographic Forecast Segment. For SFPs that contain only one geographic forecast segment, the UGC will be on the line immediately after the AWIPS ID (SFPxxx) line. See Figure 8 for a format description.

7.3.4.3 Multiple Geographic Forecast Segments. For regionally approved SFPs that contain two or more geographic forecast segments, the UGC and a suitable geographic name will appear immediately before each separate geographic forecast segment followed by a double dollar (\$\$) delimiter after each segment. The UGC uses the appropriate public zones to differentiate areas. See Figure 9 for a format description.

```

FPaaii cccc ddhhmm
SFPxxx
stZNNN-NNN>NNN-stZNNN-ddhhmm-

STATE FORECAST FOR [state/area]
NATIONAL WEATHER SERVICE [forecast office, state]
time am/pm time_zone day mon dd yyyy

...HEADLINE(s)... (as appropriate)

.TODAY... (6am-6pm) (Max temp)
.TONIGHT... (6pm-6am) (Min temp)
.DAY 2... (6am-6pm) (Max temp)
.DAY 3... (6am-6am) (Min/Max temp)
.DAY 4... (6am-6am) (Min/Max temp)
.DAY 5... (6am-6am) (Min/Max temp)

$$

Fcstr Name/Initials/ID (optional)

```

**Figure 8.** One Geographic Forecast Segment. This is an example of a morning issuance.

```

FPaaii cccc ddhhmm
SFPxxx

STATE FORECAST FOR [state/area]
NATIONAL WEATHER SERVICE [forecast office, state (optional)]
time pm time_zone day mon dd yyyy

stZNNN-NNN>NNN-stZNNN-ddhhmm-
[part of state/area]-
[NATIONAL WEATHER SERVICE forecast office, state](optional as necessary)
time pm time_zone day mon dd yyyy
...HEADLINE(s)... (as appropriate)

.TONIGHT... (6pm-6am) (Min temp)
.TOMORROW... (6am-6pm) (Max temp)
.TOMORROW NIGHT... (6pm-6am) (Min temp)
.DAY 2... (6am-6pm) (Max temp)
.DAY 3... (6am-6am) (Min/Max temp)
.DAY 4... (6am-6am) (Min/Max temp)
.DAY 5... (6am-6am) (Min/Max temp)

$$ (UGC delimiter)

stZNNN-NNN>NNN-stZNNN-ddhhmm-
[part of state/area]-
[NATIONAL WEATHER SERVICE forecast office, state](optional as necessary)
time pm time_zone day mon dd yyyy
...HEADLINE(s)... (as appropriate)

.TONIGHT... (6pm-6am) (Min temp)
.TOMORROW... (6am-6pm) (Max temp)
.TOMORROW NIGHT... (6pm-6am) (Min temp)
.DAY 2... (6am-6pm) (Max temp)
.DAY 3... (6am-6am) (Min/Max temp)
.DAY 4... (6am-6am) (Min/Max temp)
.DAY 5... (6am-6am) (Min/Max temp)

$$ (UGC delimiter)

etc...

```

**Figure 9.** Multiple Geographic Forecast Segments from one or more WFOs. This is an example of an evening issuance.

7.3.5 Content. The SFP should concentrate on the most significant hydrometeorological conditions expected to affect major parts or all of the forecast area to keep the forecast from becoming unnecessarily complicated. In general, more detail should be found in the earlier periods. The SFP should contain the following weather elements (except where noted):

- a. Headlines. Headlines should be consistent with the format described for the ZFP found in section 9.3.5.2.
- b. References to Holidays. Ten federally recognized U.S. national holidays will be used to identify the daytime, or combined day/night periods, instead of the days of the week (see ZFP section 9.3.5.1 for specific holidays).

- c. Precipitation. When precipitation is forecast, specify and, if necessary, qualify the type and intensity, e.g., "LIGHT RAIN," or "HEAVY SNOW," "DRIZZLE." To describe the likelihood of precipitation, use POP qualifying terms of uncertainty such as "CHANCE," and "LIKELY." Actual POP percentages are not used in the SFP. Use modifying terms in accordance with procedures for ZFP as discussed in section 9.3.5.3.
- d. Maximum/Minimum Temperature. For each day and night period in the 12-hour forecast periods, include the expected maximum and minimum temperature, respectively. For 24-hour combined periods enter the minimum temperature first, followed by the maximum temperature.

If significant, temperature trends (i.e., highs or lows varying by about 10 degrees or more than previous highs or lows) should be included. For example, "MUCH WARMER WITH LOWS IN THE 70S AND HIGHS IN THE 80S". The statement on forecast temperatures should be as simple as possible, yet it should note the extremes that exist. It is not intended that every variance in temperature be covered; in some mountainous, coastal, or hilly areas, the full delineation of temperature extremes is impractical.

If the temperature is expected to fall throughout the day, rise throughout the night, or remain steady, indicate the temperature expected at the end of that specified time (primarily in the 12-hour forecast periods).

Numerical temperature values should be presented in either of the following two ways.

- (1) General ranges where the terms are defined as follows.
  - "LOWER 50S" (50, 51, 52, 53)
  - "MID 50S" (54, 55, 56)
  - "UPPER 50S" (57, 58, 59)
  - "60S" (60 through 69)
- (2) A specific range. For ranges below 10 or above 100, any numbers may be used.
  - "45 TO 55"
  - "5 BELOW TO 15 BELOW ZERO"
  - "102 TO 108"

- e. Sky Cover. The predominant sky cover will be included in each 12-hour forecast period. For combined periods, the sky cover may be omitted if it can be inferred from a forecast of precipitation.
- f. Wind. The forecast should include wind direction and speed and their associated descriptive terms in the 12-hour periods when significant (generally sustained 25 mph or greater). Use the associated descriptive terminology within the 24-hour

periods of the forecast. See table 1 for the acceptable descriptive terminology for wind (sustained 25 mph or greater).

- g. Other Elements. The 12-hour periods of the SFP will include other elements, if considered significant, e.g., wind chill, heat and humidity, frost, freeze conditions, fog, other obstructions to visibility (when 1/4 mile or less), etc. Include fog whenever it is dense enough to contribute to hazardous driving conditions. Mention frost if it is expected to affect a large part of the forecast area. These elements may also be entered into any of the 24-hour periods at regional discretion.

7.3.5.1 References to Locations. If significant conditions are expected in only part of the forecast area, this should be clearly specified. If the weather distribution is caused by topography, then accepted topographic divisions, such as mountains, valleys, coast, shore, Plains, etc., should be used. In other cases commonly understood subdivision terms, such as "panhandle," or general phrases, such as "northwest Iowa" or "southeast Texas", may be used. Long and/or confusing combinations should be avoided.

7.4 Updates and Corrections. At a minimum, the SFP should be updated as soon as practical whenever Long Duration Hazardous Weather conditions (as defined in Appendix B) dictate a change to Long Duration Hazardous Weather Headlines highlighting an SFP. Corrections will be used to indicate an error (typographic, mislabeling, etc., not forecaster judgment) was made in the previously issued forecast.

## 8. Tabular State Forecast Product (product category SFT).

8.1 Mission Connection. The SFT is a general public forecast of hydrometeorological conditions at specific locations over a WFO's geographic area of responsibility and/or an entire state through Day 7. While the forecast area typically includes part of one or more states, designated WFOs issue the SFT for specified locations to adequately represent forecast conditions across one entire state. In some locations, generation of entire state SFTs will become available when fully supported by automated software.

### 8.2 Issuance Guidelines.

8.2.1 Creation Software. The SFT is automatically generated by the AWIPS IFPS software.

8.2.2 Issuance Criteria. The SFT will be issued twice daily by all WFOs.

8.2.3 Issuance Time. The SFT should be issued within 1-hour following the mandatory ZFP releases.

8.2.4 Valid Time. The SFT is valid from the time of release through Day 7.

8.2.5 Product Expiration Time. The SFT expires upon reaching the next mandatory issuance time.

8.3 Technical Description. The SFT is defined by the format and content described in this section.

8.3.1 UGC Type. The Tabular State Forecast Product will use the “Z” form of the UGC.

8.3.2 MND Broadcast Instruction Line. Not applicable.

8.3.3 MND Product Type Line. The MND header is “TABULAR STATE FORECAST PRODUCT FOR [state/area].”

8.3.4 Content. The SFT will be a tabular seven-day forecast for selected locations across a state or a defined area.

8.3.4.1 Product Header.

- a. Product Identifier. The SFT header will contain the standard WMO identifier along with the day and time of the product, followed by the AWIPS identifier:

```
ttaaai cccc ddhhmm
SFTxxx
```

where xxx is either the standard two-letter state identification (for a whole state forecast) or the 3-letter WFO identification (for an area forecast).

- b. Zone Identification Numbers. The zone identification numbers of the zones that are included in the state forecast are listed on the line after the product header. This list includes all of the zones for a given state or only a partial list for area forecasts. The zones incorporated in the product will include those which contain locations listed in the SFT, as well as some adjacent and intervening zones:

```
stZxxx-xxx>xxx-ddhhmm- (use all zones for whole state)
stZxxx-xxx>xxx-stZxxx-ddhhmm- (repeat state id for multiple parts
of states)
```

- c. MND Header. The final portion of the header will contain the narrative description of the forecast product, the WFO, and the date and time of the product:

```
TABULAR STATE FORECAST FOR [state/area]
NATIONAL WEATHER SERVICE [forecast office, state]
time pm time_zone day mon dd yyyy
```

8.3.4.2 Table Header. The SFT table header will immediately follow the product header and will consist of eight columns and three rows. The first row will contain the word “FCST” for each forecast period. The second and third rows include the forecast periods and dates (month/day) in columns two through seven (bolded text is included in forecasts as shown).

(Morning)	<b>FCST</b>	<b>FCST</b>	<b>FCST</b>	<b>FCST</b>	<b>FCST</b>	<b>FCST</b>	<b>FCST</b>
	<b>TODAY</b>	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
	MMMDD	MMMDD	MMMDD	MMMDD	MMMDD	MMMDD	MMMDD

(Evening)	<b>FCST</b>						
	TOMORROW	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
	MMMDD						

8.3.4.3 One-word Daytime Forecast. The first row under each city identified in the table will contain a one-word predominant daytime forecast (up to 7 characters) for each period. Daytime is defined as 6 a.m. to 6 p.m. local time. See section 4.3.3.2 for the list of valid weather abbreviations.

8.3.4.4 Temperature. The second row (i.e., beneath the significant weather row) under each city identified in the table will contain maximum and minimum temperatures in degrees Fahrenheit. Maximum temperatures are valid for the period from 7:00 a.m. to 7:00 p.m. local standard time. Minimum temperatures are valid for the period from 7:00 p.m. to 8:00 a.m. local standard time. For morning SFT issuances, the first column only contains a maximum temperature for the current day. Subsequent columns list an early morning LO followed by an afternoon HI for each day. For afternoon SFT issuances, the first column lists the LO and HI temperature for the following day. The LO temperature depicted in the first column is the overnight minimum temperature forecast (normally occurring during the following morning). Similar to the morning forecast issuance, subsequent columns depict an early morning LO followed by an afternoon HI for each day through Day 7.

Mon Morning Issuance	MON	TUE	WED	THU	FRI	SAT	SUN
	/87	66/88	70/89	68/80	64/81	66/84	63/81
Mon Evening Issuance	TUE	WED	THU	FRI	SAT	SUN	MON
	66/89	71/90	69/82	65/81	67/86	63/83	60/79

8.3.4.5 Probability of Precipitation. The third row (i.e., beneath the daytime temperature) under each city identified in the table will contain the probability of precipitation (POP) for the nighttime (6 p.m. - 6 a.m. local time) and daytime (6 a.m. to 6 p.m. local time) periods for each of the days. The possible POP categories are: 00, 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100. The POP should be formatted as shown below.

<i>Format:</i>	###/###	###/###	###/###
<i>Entry:</i>	00/20	80/100	100/00

8.3.4.6 Geographical Regions. The SFT program will contain city/location identifications and associated geographical regions. The database tables can be modified to change the geographical region names for the SFT.

```
...STATE/REGION...
CITY
```

8.3.5 Format. The SFT will follow the early morning and afternoon issuance formats as shown in Figures 10 and 11 (bolded text is included in forecasts as shown). Missing data is indicated by the code, "MM".



```

1          2          3          4          5          6          7
123456789012345678901234567890123456789012345678901234567890
ttaaai cccc ddhhmm
SFTxxx
stZXXX-XXX>XXX-ddhhmm-

TABULAR STATE FORECAST FOR [state/region]
NATIONAL WEATHER SERVICE [forecast office, state]
time pm time_zone day mmm dd yyyy

ROWS INCLUDE...
  DAILY PREDOMINANT DAYTIME WEATHER 6AM-6PM
  FORECAST TEMPERATURES...EARLY MORNING LOW/DAYTIME HIGH
  PROBABILITY OF PRECIPITATION NIGHTTIME 6PM-6AM/DAYTIME 6AM-6PM
    - INDICATES TEMPERATURES BELOW ZERO
    MM INDICATES MISSING DATA

  FCST      FCST      FCST      FCST      FCST      FCST      FCST
  TOMORROW DAY 2    DAY 3    DAY 4    DAY 5    DAY 6    DAY 7
  MMM DD    MMM DD    MMM DD    MMM DD    MMM DD    MMM DD    MMM DD

...STATE/REGION 1...
CITY 1
WXWXWX    WXWXWX    WXWXWX    WXWXWX    WXWXWX    WXWXWX    WXWXWX
LO/HI     LO/HI     LO/HI     LO/HI     LO/HI     LO/HI     LO/HI
###/###   ###/###   ###/###   ###/###   ###/###   ###/###   ###/###

CITY 2
WXWXWX    WXWXWX    WXWXWX    WXWXWX    WXWXWX    WXWXWX    WXWXWX
LO/HI     LO/HI     LO/HI     LO/HI     LO/HI     LO/HI     LO/HI
###/###   ###/###   ###/###   ###/###   ###/###   ###/###   ###/###
. . . . .
. . . . .
. . . . .

CITY 3
WXWXWX    WXWXWX    WXWXWX    WXWXWX    WXWXWX    WXWXWX    WXWXWX
LO/HI     LO/HI     LO/HI     LO/HI     LO/HI     LO/HI     LO/HI
###/###   ###/###   ###/###   ###/###   ###/###   ###/###   ###/###

...STATE/REGION 2...
CITY 2
WXWXWX    WXWXWX    WXWXWX    WXWXWX    WXWXWX    WXWXWX    WXWXWX
LO/HI     LO/HI     LO/HI     LO/HI     LO/HI     LO/HI     LO/HI
###/###   ###/###   ###/###   ###/###   ###/###   ###/###   ###/###

ETC...

$$

```

Figure 11. Tabular State Forecast - Afternoon Issuance Format.

8.4 Updates and Corrections. Corrections are issued for all routine or non-routine SFT issuances to indicate an error was made in the previously issued forecast. When a correction is

needed, reissue the entire SFT. Updates are issued when temperatures or significant weather do not accurately reflect the most current forecast.

9. **Zone Forecast Product (product category ZFP).**

9.1 **Mission Connection.** The Zone Forecast Product (ZFP) is a text product issued by all WFOs to explicitly state expected weather conditions within each **zone** (a geographic location that has sufficient climatological and meteorological homogeneity to allow a single forecast to serve as the forecast for that area) in their geographic area of responsibility through Day 7. The ZFP is used by a wide variety of users such as the media, emergency managers, and the general public. It is primarily used as a tool for planning purposes to support and promote public health, commerce, and quality of life.

9.2 **Issuance Guidelines.**

9.2.1 **Creation Software.** Weather Forecast Offices (WFO) should produce the ZFP using software formatters requiring a minimum of post editing.

9.2.2 **Issuance Criteria.** The ZFP is a dynamic text product issued by all WFOs to provide the most up-to-date forecasted weather conditions through seven days.

9.2.3 **Issuance Time.** Generation of the ZFP is driven by changing weather conditions and it may be generated at any time. However, at a minimum the ZFP will be issued twice daily to remove the outdated first period of the forecast. These mandatory issuance times will occur no later than 4:00 a.m. and 4:00 p.m. local time with one exception. During a tropical cyclone event, WFOs may delay the morning and/or afternoon issuance of the ZFP until after the Tropical Prediction Center issues its advisories. In these circumstances, the ZFP should be issued as soon as reasonably possible, and no later than 1.5 hours after receiving the TPC message.

9.2.4 **Valid Time.** The ZFP is valid from the time of release through Day 7.

9.2.5 **Product Expiration Time.** The ZFP expires upon reaching the next mandatory issuance time.

9.3 **Technical Description.** The ZFP will follow the format and content described in this section.

9.3.1 **Universal Geographic Code (UGC) Type.** The ZFP will use the (Z) form of the UGC.

9.3.2 **Mass News Disseminator (MND) Broadcast Instruction Line.** There is no MND Broadcast Instruction Line associated with this product.

9.3.3 **MND Product Type Line.** The Zone Forecast Product MND line is, "ZONE FORECASTS," which may be followed by a descriptive area.

9.3.4 Format. The ZFP will follow the formats specified in Figures 12 and 13. The ZFP is divided into 13 distinct forecast periods for the early morning issuance, and 14 periods for the afternoon issuance. Each forecast period is a 12-hour block of time coinciding with either the daylight or nighttime hours.

<u>Product Format</u>	<u>Description of Entry</u>
FPaaai cccc ddhhmm ZFPxxx	<b>WMO Heading</b> <b>AWIPS ID</b>
ZONE FORECASTS [name of area](optional) NATIONAL WEATHER SERVICE CITY STATE time am time_zone day mon dd yyyy	<b>NWS Product Name</b> <b>Issuing Office</b> <b>Issuance Local Time/Date</b>
stZXXX-XXX>XXX-ddhhmm- zone-zone-zone-zone-zone-zone- INCLUDING THE CITIES OF city...city...city time am time_zone day mon dd yyyy	<b>UGC Type(Zone)&amp; Expir.Time</b> <b>Zone Names (may incl. state ID)</b> <b>City Names</b> <b>Issuance Local Time/Date</b>
...Long-duration watch/warning(s) or significant headline(s) as required...	
<i>Forecast Period</i>	<i>Valid times</i>
.TODAY...	(6am-6pm)
.TONIGHT...	(6pm-6am)
.DAY 2...	(6am-6pm)
.DAY 2 NIGHT...	(6pm-6am)
.DAY 3...	(6am-6pm)
.DAY 3 NIGHT...	(6pm-6am)
.DAY 4...	(6am-6pm)
.DAY 4 NIGHT...	(6pm-6am)
.DAY 5...	(6am-6pm)
.DAY 5 NIGHT...	(6pm-6am)
.DAY 6...	(6am-6pm)
.DAY 6 NIGHT...	(6pm-6am)
.DAY 7...	(6am-6pm)
.<                   TEMPERATURE       /       PRECIPITATION	<b>Specific site forecast at</b>
CITY 1               MAX MIN MAX       /       POP POP POP	<b>Regional discretion</b>
CITY 2               MAX MIN MAX       /       POP POP POP	
\$\$	<b>UGC delimiter</b>
NAME/INITIALS/FCSTR ID (optional)	
All times are local. Abbreviations and contractions, other than PM, AM, MPH and time zones (EST, CST, MDT, PST, etc.), are NOT permitted.	

**Figure 12.** Zone Forecast Product Format - Early Morning Issuance.

<u>Product Format</u>	<u>Description of Entry</u>
FPaa <i>ii</i> cccc ddhhmm ZFPxxx	<b>WMO Heading</b> <b>AWIPS ID</b>
ZONE FORECASTS [name of area] (optional) NATIONAL WEATHER SERVICE CITY STATE time pm time_zone day mon dd yyyy	<b>NWS Product Name</b> <b>Issuing Office</b> <b>Issuance Local Time/Date</b>
stZXXX-XXX>XXX-ddhhmm- zone-zone-zone-zone-zone-zone- INCLUDING THE CITIES OF city...city...city time pm time_zone day mon dd yyyy	<b>UGC Type(Zone) &amp; Expire. Time</b> <b>Zone Names (may incl. state ID)</b> <b>City Names</b> <b>Issuance Local Time/Date</b>
<i>...Long-duration watch/warning(s) or significant headline(s) as required...</i>	
<i>Forecast Period</i>	<i>Valid times</i>
.TONIGHT...	(6pm-6am)
.TOMORROW...	(6am-6pm)
.TOMORROW NIGHT...	(6pm-6am)
.DAY 2...	(6am-6pm)
.DAY 2 NIGHT...	(6pm-6am)
.DAY 3...	(6am-6pm)
.DAY 3 NIGHT...	(6pm-6am)
.DAY 4...	(6am-6pm)
.DAY 4 NIGHT...	(6pm-6am)
.DAY 5...	(6am-6pm)
.DAY 5 NIGHT...	(6pm-6am)
.DAY 6...	(6am-6pm)
.DAY 6 NIGHT...	(6pm-6am)
.DAY 7...	(6am-6pm)
.<                   TEMPERATURE                   /   PRECIPITATION	<b>Specific site forecast at</b>
CITY 1               MIN MAX MIN MAX       /   POP POP POP POP	<b>Regional discretion</b>
CITY 2               MIN MAX MIN MAX       /   POP POP POP POP	
\$\$	<b>UGC delimiter</b>
NAME/INITIALS/FCSTR ID (optional)	
All times are local. Abbreviations and contractions, other than PM, AM, MPH and time zones (EST, CST, MDT, PST, etc.), are NOT permitted.	

**Figure 13.** Zone Forecast Product Format - Afternoon Issuance.

9.3.4.1 Combining Periods The first period of the forecast must stand alone. All other forecast periods may be combined when weather elements (including winds and restrictions to visibility) are similar. Regional Headquarters will define weather element similarity, i.e., combination thresholds.

9.3.5 Content. The ZFP should always reflect the observed, imminent and/or expected weather conditions to affect specific zones or zone groupings. The ZFP includes headlines (when applicable), and the following weather parameters: precipitation and probability of precipitation,

sky cover, temperature, wind, and visibility restrictions. Wind and visibility restriction elements are optional beyond the fifth period. Forecast attention and detail should be focused on those periods where weather is most significant. Likewise, within each period, forecasts should be arranged to emphasize unusual or dangerous weather elements first. In these situations, sky cover or POPs may be omitted or rearranged to allow for the unusual or dangerous information to be highlighted. Forecast content is described in more detail in the following sections.

9.3.5.1 References to Holidays. Ten federally recognized U.S. national holidays will be used to identify the daytime zone periods instead of the days of the week (See Figure 14). These ten holidays refer to the actual day on which they occur.

<b>Federally Recognized Holiday</b>	<b>Day/Date Referenced in ZFP</b>
NEW YEARS DAY	January 1
MARTIN LUTHER KING JR DAY	Third Monday in January
PRESIDENTS DAY	Third Monday in February
MEMORIAL DAY	Last Monday in May
INDEPENDENCE DAY	July 4
LABOR DAY	First Monday in September
COLUMBUS DAY	Second Monday in October
VETERANS DAY	November 11
THANKSGIVING DAY	Fourth Thursday in November
CHRISTMAS DAY	December 25

**Figure 14.** Ten Federally Recognized Holidays.

9.3.5.2 Headlines. Headlines will be brief and clearly convey complete ideas; they are not intended to convey great detail or serve as an alternative to other NWS forecast products. There are two types of headlines: *Long Duration Hazardous Weather*, and *Significant Weather*. Automated software inserts these headlines into the ZFP whenever long duration hazardous weather conditions (as specified in Appendix B) are forecast to occur. WFOs may also wish to enhance the value of the forecast by including headlines for conditions that do not meet watch, warning, or advisory criteria. In these instances, WFOs may manually insert a Significant Weather Headline through forecast post-editing (see examples in Appendix B).

When warranted, two or more headlines should be used. Headlines should be reserved for the first three days of the forecast (See Figure 15).

<p>• <b><u>Singular Headlines:</u></b></p> <p>...NEAR RECORD LOW TEMPERATURES EXPECTED TONIGHT...<i>Significant</i></p> <p>...HEAVY SNOW WARNING IN EFFECT FROM 9 AM THIS MORNING TO 11 AM EST WEDNESDAY...<i>Long Duration Hazardous</i></p> <p>• <b><u>Multiple Headlines:</u></b></p> <p>...HIGH WIND WARNING IN EFFECT UNTIL 3 PM THIS AFTERNOON...<i>Long Duration Hazardous</i></p> <p>...ICE STORM WARNING IN EFFECT FROM 5 AM WEDNESDAY TO 5 AM EST THURSDAY...<i>Long Duration Hazardous</i></p> <p>...HIGH SURF ADVISORY IN EFFECT UNTIL 6 PM THIS EVENING...<i>Long Duration Hazardous</i></p> <p>...DANGEROUS RIP CURRENTS AT THE BEACHES TODAY...<i>Significant</i></p>
--

**Figure 15.** Headline Examples.

9.3.5.3 Precipitation and Probability of Precipitation (POP) Forecasts. Forecasts will describe expected measurable precipitation (0.01 inch) across each zone for all periods through Day 7. For stratiform weather situations, the POP range (to the nearest whole 10 percent) should extend from 20 to 100 percent. In convective weather situations, 10 percent may also be used to better describe isolated precipitation.

- a. Precipitation Events. Precipitation forecasts will specify the type and, as appropriate, qualify the intensity. Specify the approximate time of the beginning and ending of an extended period of precipitation when distinct and known. Place particular attention on specific timing for the first three periods.
- b. Precipitation Intensity. During the first 72 hours of the forecast, intensity of precipitation should be identified as light, moderate (*characterized by the absence of a modifying term to describe the intensity*), or heavy. Beyond 72 hours of the forecast, no intensity designator should be applied to the grids. By default, this indicates a mid-range, moderate intensity forecast and reflects forecaster uncertainty.
- c. Qualifying Terms. When POPs are separated from the precipitation element, qualifying terms will be used to aid public understanding. Qualifying terms will conform to the definitions found in Table 20 below.

POP	Qualifying Term	Equivalent Areal Term (convective only)
10	SLIGHT CHANCE or none	ISOLATED or none
20	SLIGHT CHANCE	ISOLATED
30 40 50	CHANCE	SCATTERED

60 70	LIKELY	NUMEROUS
80 90 100	NONE	NONE

**Table 20.** Qualifying and Equivalent Areal Terms .

An exception that justifies use of a lower POP is for those areas where isolated, high-based thunderstorms may (by virtue of their areal coverage or sub-cloud evaporation) result in any given area having only a slight chance (i.e., 10%) of measurable rainfall.

Do not combine **qualifying** and **areal** terms. For example, “NUMEROUS SHOWERS LIKELY” and “CHANCE OF SCATTERED SHOWERS” are improper forecasts. When POPs are categorical (80 percent or greater), duration qualifiers may be used to clarify the forecast (See Figure 16).

<p><b>Brief</b> - short; abrupt  <b>Frequent</b> – persistent short intervals  <b>Occasional</b> – occurring at irregular or infrequent intervals  <b>Periods of</b> – series of episodes  <b>Intermittent</b> – starting and stopping at intervals; not continuous</p>
---

**Figure 16.** Duration Qualifiers.

Do not combine **Duration qualifiers** with **qualifying** or **areal** terms. For example, “CHANCE OF INTERMITTENT SHOWERS” and “FREQUENT SCATTERED THUNDERSTORMS” are improper.

- d. Snowfall Accumulation. Quantitative snowfall accumulations (e.g., 2 inches, 6-10 inches) should be included in the first three periods of the forecast whenever the POP forecast is 60% or greater. If a snow event is forecast to end in the 1<sup>st</sup>, 2<sup>nd</sup> or 3<sup>rd</sup> period, a storm total amount should be included in the final period the snow is forecast to end. If snow is forecast to begin in, or continue after the 3<sup>rd</sup> period, *generalized* quantitative snowfall amounts (e.g., up to 8 inches possible, greater than 6 inches possible), or descriptive terms such as “LIGHT,” “HEAVY,” or “ADDITIONAL ACCUMULATION(S)” should be used.

Snowfall accumulations should not be mentioned in the ZFP when the POP forecast is less than 60%, except in the following two instances:

- (1) Issuance of a Winter Storm Watch with a 50% POP (associated *generalized* quantitative snowfall amounts used) or;
- (2) When snow showers or squalls are forecast to produce localized snowfall accumulations (high probability of occurrence, but associated POP may be low as it refers to areal coverage).

Snow accumulations (quantitative or generalized quantitative) should not be used beyond the 4<sup>th</sup> period in the ZFP. If necessary, use descriptive terms instead.

- e. Precipitation Terminology. Precipitation types used in the ZFP will conform with standard terminology found in FMH #1 (see Appendix C) with the following exceptions:
- (1) “Snow” will be the term used to indicate snow, snow pellets, and snow grains.
  - (2) “Sleet” will be used instead of “ice pellets”
- f. Mixed and Multiple Precipitation Types. The forecast should clearly indicate the probability of measurable precipitation -- not the chance of changing from one type of precipitation to another (See Figure 18). Avoid confusing wording implying the likelihood of changing to snow, e.g., “70 PERCENT CHANCE OF RAIN CHANGING TO SNOW.”
- g. Cases Where No POP Value is Required. A POP value is not required when:
- (1) Zone forecasts include the optional in-line point forecasts for specific cities
  - (2) Precipitation is occurring
  - (3) Terrain is topographically complex. (e.g., mountains, plateaus)
  - (4) The POP value is less than or equal to 20 percent
  - (5) For trace precipitation events
- Terms such as dry thunderstorms, sprinkles, drizzle, flurries, etc., may be used to imply very light precipitation resulting in trace events. During events of prolonged drizzle or flurries that can produce measurable precipitation, include a POP.
- h. Trace Events. Trace precipitation events (e.g., drizzle and snow flurries) are non-measurable events. Therefore, a POP statement should not be used. Instead, qualifying terms should be used to indicate the likelihood of precipitation not expected to produce measurable quantities (See Figure 17).

► Examples of acceptable wording include:

“OCCASIONAL DRIZZLE” or “DRIZZLE THIS MORNING”  
“SCATTERED SNOW FLURRIES” or “SNOW FLURRIES LIKELY”

**Figure 17.** Acceptable Wording Examples for Trace Events.

- i. Precipitation Presentation Methods. The POP statement may be worded in a variety of ways (See Figure 18).
  - (1) Use a separate POP statement at the end of the period. This statement begins with the equivalent terms "Chance" or "Probability of Precipitation" .
  - (2) Include POP in the body of the forecast with the specific precipitation type
  - (3) Use the term "Precipitation" where precipitation type is uncertain, or for mixed or certain multiple precipitation events (e.g., sleet and rain, etc.).

<p>▶ Separate POP statement at the end of the period</p> <p>.TODAY...CLOUDY WITH SCATTERED SHOWERS ENDING IN THE MORNING...THEN BECOMING PARTLY SUNNY. HIGHS IN THE MID 70S. SOUTHEAST WINDS 10 TO 20 MPH. CHANCE OF RAIN 40 PERCENT.</p> <p>▶ POP statement as part of forecast narrative</p> <p>.FRIDAY...MOSTLY CLOUDY. A 50 PERCENT CHANCE OF SHOWERS AND THUNDERSTORMS. HIGHS NEAR 80. SOUTHEAST WINDS 5 TO 15 MPH.</p> <p>▶ Trace events (no POP)</p> <p>.TONIGHT...CLOUDY WITH AREAS OF DRIZZLE AND FOG. LOWS IN THE UPPER 40S. SOUTH WINDS 5 TO 10 MPH.</p> <p>▶ Mixed and multiple precipitation</p> <p>.TONIGHT...RAIN LIKELY...BECOMING MIXED WITH SNOW AFTER MIDNIGHT. LOWS IN THE LOWER 30S. NORTH WINDS 10 TO 15 MPH. CHANCE OF PRECIPITATION 70 PERCENT.</p> <p>.TODAY...SNOW AND SLEET...CHANGING TO FREEZING RAIN BY NOON. SNOW ACCUMULATION 3 TO 6 INCHES. HIGHS IN THE LOWER 30S. NORTHEAST WINDS 5 TO 15 MPH. CHANCE OF PRECIPITATION NEAR 100 PERCENT.</p>
---

**Figure 18.** POP Statement Examples.

9.3.5.4 Sky Cover. Each forecast period will include a predominant sky cover as shown in Table 21. **Exception:** The sky cover element is optional when the POP is greater than or equal to 60% and precipitation is expected to occur for the majority of the forecast period.

Daytime Expressions	Nighttime Expressions	Predominant Opaque Sky Cover (Percent)
SUNNY or CLEAR	CLEAR	0% to ≤ 5%
SUNNY or MOSTLY CLEAR	MOSTLY CLEAR	> 5% and ≤ 25%
MOSTLY SUNNY or PARTLY CLOUDY	PARTLY CLOUDY	> 25% and ≤ 50%

PARTLY SUNNY or MOSTLY CLOUDY	MOSTLY CLOUDY	> 50% and ≤ 69%
MOSTLY CLOUDY or CONSIDERABLE CLOUDINESS	MOSTLY CLOUDY or CONSIDERABLE CLOUDINESS	> 69% and ≤ 87%
CLOUDY or OVERCAST	CLOUDY or OVERCAST	> 87% and ≤ 100%

**Table 21.** Predominant Sky Cover Thresholds.

Sky Cover Presentation Methods. Sky Cover will be presented in one of the following formats shown in Figure 19.

- ▶ No precipitation in the forecast  
 .TONIGHT...PARTLY CLOUDY. LOWS IN THE MID 30S. SOUTH WINDS 5 TO 10 MPH.
- ▶ Precipitation is included in the forecast, but the POP is less than 60 percent (third period forecast)  
 .FRIDAY...MOSTLY CLOUDY WITH A CHANCE OF SNOW. HIGHS IN THE UPPER 20S. NORTHWEST WINDS 10 TO 15 MPH. CHANCE OF SNOW 50 PERCENT.
- ▶ A sky cover term may be omitted if the POP is 60 percent or greater and the precipitation event is expected to occur for most of the forecast period  
 .SATURDAY...RAIN LIKELY. HIGHS IN THE UPPER 70S. SOUTH WINDS 5 TO 15 MPH. CHANCE OF RAIN 60 PERCENT.

**Figure 19.** Sky Cover Presentations.

9.3.5.5 Temperature. Each forecast period will include the expected high or low temperatures.

a. Temperature Presentation Methods. Temperatures will be presented in one of the following formats:

- (1) Implied range terminology. NEAR and AROUND are defined as plus or minus 2 degrees about a certain number. NEAR FREEZING is also permitted. For example, LOWS AROUND 40 means 38 to 42 inclusive.
- (2) A range as defined by the following examples (Regional guidance may alter these ranges based upon topography):  
 LOWER 50S (50, 51, 52, 53)  
 MID 50S (54, 55, 56)  
 UPPER 50S (57, 58, 59)
- (3) A specific range of 5 degrees (5 to 10 degrees in mountainous areas), *unless specified by regional guidance:*

LOWS 20 TO 25      HIGHS 47 TO 52

Care must be taken when using a temperature range format. Too many numbers may confuse the user. Keep the range as small as possible (see Table 22).

<u>Use</u>	<u>Avoid</u>
HIGHS AROUND 60	HIGHS IN THE UPPER 50S TO LOWER 60S
LOWS IN THE LOWER 40S	LOWS AROUND 40 TO THE LOWER 40S
HIGHS 25 TO 30	HIGHS IN THE MID TO UPPER 20S
LOWS 66 TO 71	LOWS IN THE MID 60S TO LOWER 70S

**Table 22.** Recommended Temperature Terminology.

- b. Non-diurnal Temperature Trends. If the temperature is forecast to fall during the day, rise during the night, or remain steady; indicate the temperature expected at the end of the period. Use phrases such as "STEADY", "FALLING", or "RISING TEMPERATURES" to help explain the situation. For example, "TEMPERATURES FALLING INTO THE UPPER 40S LATE THIS AFTERNOON."
- c. Hundreds, Near Zero, and Sub-Zero Temperatures. For forecasted temperatures above 100 degrees, and near or sub-zero temperatures, use a specific numeric range. Ensure that the absolute value of the temperature forecasts is increasing and spell out the words "ABOVE", "BELOW" and "MINUS" when referencing the temperature. For example:
  - "102 TO 107"
  - "5 BELOW TO 5 ABOVE ZERO"
  - "5 BELOW TO 10 BELOW ZERO"
  - "MINUS 5 TO MINUS 15"
  - "ZERO TO 5 ABOVE" or "ZERO TO 5 BELOW"
- d. Extreme Temperature Conditions. Wind Chill and Heat Index values will be included in the forecast and/or headlines in accordance with the criteria established by Regional Headquarters' policy.

9.3.5.6 Wind. Wind direction and speed will be included in the first five periods of the zone forecast (*regional guidance may alter wind forecast requirements for areas having complex terrain*). Deterministic winds (specific wind direction and speed) should only be referenced beyond the fifth period in the ZFP when those later forecast periods are combined with periods two through five. In these cases, a single wind speed and direction (which applies to all combined periods) is provided in the forecast narrative.

A descriptive term or phrase will be used in the forecast narrative in any period where the wind is expected to be significant (e.g., 15 to 25 MPH or greater). Acceptable descriptive terms are

shown in Table 23. These terms may be locally or regionally adjusted for climatology, except for those terms linked to warning definitions (e.g., hurricane warning).

- a. Wind Direction. Wind direction will reference the location from which the wind is blowing. It is denoted by the eight points of the compass: NORTH, NORTHEAST, EAST, SOUTHEAST, SOUTH, SOUTHWEST, WEST, and NORTHWEST. Changes in direction within a forecast period should be forecast. Wind direction terminology that is well-known to the local users is also acceptable. For example, in tropical regions, the wind direction may be referred to as “TRADES.” Additionally, terms such as “SEA BREEZE,” “LAKE BREEZE,” “ONSHORE WINDS,” and “DOWNSLOPE WINDS” are permitted.
- b. Wind Speed. Wind speed will be expressed in miles per hour, abbreviated “MPH.” A speed range may be given. The largest desired range is 10 mph. Ranges up to 20 mph may be used for wind events with speeds of 40 mph or greater (i.e., strong or hurricane force categories). The wind speed should be rounded to the nearest 5 MPH.

Sustained Wind Speed Range (MPH)	Descriptive Term or Phrase
0 to 5	Light, Light and variable, or Calm
5 to 15	(None used)
10 to 20	(None used)
15 to 25	Breezy (mild temperatures) Brisk (cold temperatures) Blustery (cold and with frequent gusts)
20 to 30	Windy
25 to 35	Windy
30 to 40	Very Windy
35 to 45	Very Windy, Strong Winds
40 to 73	Strong Winds, Damaging Winds, Dangerous Winds, High Winds
74 or greater	Hurricane Force

**Table 23.** Acceptable Descriptive Terminology for Wind.

- c. Gusts. Wind gusts should be included when they are forecast to exceed the sustained wind speed by at least 10 MPH. Gusts are not included when sustained wind speeds are forecast to remain below 10 mph. An upper limit to the gusts should be included.
- d. Tropical Cyclones and other Extreme Events. During extreme wind events

(e.g., hurricane, Nor ‘easter) where substantial uncertainty in wind speed exists, forecasters should ensure collaboration with surrounding offices and/or the tropical cyclone centers.

Tropical cyclone centers are the official sources for tropical cyclone forecasts, watches, and warnings. When a WFO’s geographical area of responsibility falls within a tropical cyclone center watch or warning, the WFO should collaborate winds and issue forecasts consistent with the respective tropical cyclone center’s products.

- e. Wind Presentation Methods. Present wind forecasts in one of the following formats shown in Figure 20.

- ▶ Sustained wind as a range or single value
  - EAST WINDS 5 TO 15 MPH
  - WEST WINDS 20 TO 30 MPH...BECOMING NORTHWEST AND DECREASING TO AROUND 10 MPH IN THE EVENING
- ▶ Sustained wind range and gust statement - Avoid use of the general wind descriptor term “gusty.” Instead, provide the user with a specific upper limit of wind gust magnitude.
  - SOUTH WINDS 40 TO 60 MPH WITH GUSTS TO 90 MPH POSSIBLE NEAR THE HEADLANDS
  - NORTHWEST WINDS 15 TO 25 MPH WITH GUSTS TO 35 MPH
- ▶ Wind speed trend
  - SOUTH WINDS DECREASING TO 30 MPH WITH GUSTS TO 45 MPH
- ▶ Light and variable winds (usually 5 mph or less)
  - LIGHT [direction] WINDS
  - LIGHT AND VARIABLE WINDS
  - LIGHT WINDS
  - CALM WINDS

**Figure 20.** Wind Presentation Methods.

9.3.5.7 Visibility Restrictions. Forecasts will include visibility restrictions, such as fog, haze, smoke, blowing snow, blowing dust and volcanic ash; when visibilities are forecast to be less than or equal to 1/4 mile through the first five periods of the ZFP. Visibility restrictions may be included in the forecast text for visibilities greater than 1/4 mile up to 6 miles, based on local user requirements.

- a. Visibility Restrictions Presentation Method. When fog, haze, smoke, blowing snow, blowing dust or volcanic ash is occurring or is forecast to reduce the visibility to 1/4 mile or less; describe the visibility obstruction and its

corresponding reduced distance within the body of the forecast text. Areal coverage terms used to describe restrictions to visibility are: PATCHY, AREAS, and WIDESPREAD (see Appendix B - Definitions and General Terminology).

Visibility restriction forecasts will be presented in a format similar to the examples shown in Figure 21.

```

▶ ...DENSE FOG ADVISORY IN EFFECT FROM 1 AM TO 10 AM EST WEDNESDAY...

.TONIGHT...CLEAR EARLY. WIDESPREAD DENSE FOG DEVELOPING AFTER MIDNIGHT.
VISIBILITIES DECREASING TO LESS THAN ONE QUARTER OF A MILE. LOWS IN THE
MID 40S. CALM WINDS.

▶ ...DUST STORM WARNING IN EFFECT UNTIL 5 PM MST THIS AFTERNOON...

.TODAY...VERY WINDY WITH AREAS OF BLOWING DUST. VISIBILITIES MAY BE
REDUCED TO AROUND 1/4 MILE AT TIMES. HIGHS AROUND 80. NORTHWEST WINDS 30
TO 40 MPH WITH GUSTS TO 50 MPH.
    
```

**Figure 21.** Visibility Restriction Presentation Examples.

9.4 Updates and Corrections. Forecasts will be updated and corrected when the on-duty forecast team believes the current forecast is not representative, or when format or content errors are detected. When updating or correcting a ZFP, the entire zone package should be re-transmitted to ensure proper dissemination to our users.

Updated and corrected forecasts will include the appropriate "BBB" group in the WMO communications header. Updated and corrected forecasts are counted ("lettered") independently. Subsequent updates and corrections for the same zone forecast package are incremented to the next letter of the alphabet "(i.e., AAA to AAB...AAX, CCA to CCB...CCX)." Table 24 illustrates the procedures for updated and corrected forecasts.

TIME (Local)	ZFP Issued	BBB Group
400 AM	Early Morning ZFP	None
440 AM	First Correction to ZFP	CCA
930 AM	First Update to ZFP	AAA
1130 AM	Second Update to ZFP	AAB
130 PM	Third Update to ZFP	AAC
400 PM	Afternoon ZFP	None
930 PM	First Update to ZFP	AAA

**Table 24.** Updated and Corrected Forecasts and "BBB" Group.

9.4.1 ZFP Update. The ZFP should be kept current to continually reflect the latest weather conditions for our “push” and “pull” users. Therefore, updates should be issued whenever observed conditions are not accurately represented, or expected conditions are not reflected in the forecast. Rapidly changing weather conditions may require multiple forecast updates. Updates should be issued as frequently as necessary (without limitation) to maintain a continuously current forecast. An example of the updated product format is shown in Figure 22.

Two basic rules have been established to provide forecast update guidance. They are not intended to be all encompassing and should be used with the understanding that written instructions cannot address every possible circumstance. At a minimum, WFOs will update the zone forecast under the following circumstances:

- a. Any long duration (in effect for three hours or more) watch, warning, or advisory is issued (or canceled) for any part of the forecast area.
- b. Any element in the gridded forecast database domain is unrepresentative of the expected or current conditions including: precipitation (timing, type, accumulation, and intensity), sky cover, wind (direction and speed), temperature (value or trend) and/or restrictions to visibility.

```

▶ Second ZFP update for a Severe Thunderstorm Watch. Notice the location of AAB,
UPDATED, and brief description for the update.

FPUS54 KSJT 131712 AAB
ZFPSJT

ZONE FORECASTS FOR WEST CENTRAL TEXAS...UPDATED
NATIONAL WEATHER SERVICE SAN ANGELO TX
1112 AM CST TUE FEB 13 2001

TXZ049-054-098-099-113-114-127-128-132300-
CALLAHAN-FISHER-HASKELL-JONES-NOLAN-SHACKELFORD-TAYLOR-THROCKMORTON-
INCLUDING THE CITIES OF...ABILENE...ALBANY...ANSON...BAIRD...
HASKELL...ROBY...SWEETWATER...THROCKMORTON
1112 AM CST TUE FEB 13 2001

UPDATED FOR A SEVERE THUNDERSTORM WATCH

...SEVERE THUNDERSTORM WATCH IN EFFECT UNTIL 5 PM CST...

.THIS AFTERNOON...SCATTERED THUNDERSTORMS...SOME SEVERE WITH DAMAGING WINDS
AND LARGE HAIL. MOSTLY CLOUDY WITH HIGHS 80 TO 85. SOUTH WINDS 15 TO 20 MPH.
CHANCE OF RAIN 50 PERCENT.
    
```

**Figure 22.** ZFP Update Example.

9.4.2 ZFP Correction. Correct forecasts for informational, grammatical, typographical and format errors. If an error is found after transmission, correct the error using the format shown in Figure 23.

- ▶ First ZFP correction for a typographical temperature error. Notice the location of “CCA,” “...CORRECTED,” and brief description of the correction.

FPUS54 KFWD 131600 **CCA**  
ZFPFWD

ZONE FORECASTS...**CORRECTED**  
NATIONAL WEATHER SERVICE FORT WORTH TX  
1000 AM CST TUE FEB 13 2001

TXZ117>120-131>134-144>146-132215-  
BOSQUE-DALLAS-ELLIS-HILL-HOOD-JOHNSON-NAVARRO-PARKER-ROCKWALL-SOMERVELL-  
TARRANT-  
INCLUDING THE CITIES OF...CLEBURNE...CORSICANA...DALLAS...FT WORTH...  
GLEN ROSE...GRANBURY...HILLSBORO...MERIDIAN...ROCKWALL...WAXAHACHIE...  
WEATHERFORD  
1000 AM CST TUE FEB 13 2001

**CORRECTED FOR TYPOGRAPHICAL TEMPERATURE ERROR**

.THIS AFTERNOON...PARTLY CLOUDY. HIGHS IN THE LOWER 60S. NORTHWEST WINDS  
AROUND 10 MPH.

**Figure 23.** ZFP Correction Example.

**APPENDIX A – Product Guidelines and Examples**

<u>Table of Contents:</u>	<u>Page</u>
1. Area Forecast Discussion Example.....	A-2
2. Point Forecast Matrices (Early Morning Issuance).....	A-3
2.1 Point Forecast Matrices (Afternoon Issuance).....	A-4
3. Recreational Report (REC) Examples.....	A-4
3.1 Glacier Park Recreational Forecast.....	A-5
3.2 Mount Rainier Recreational Forecast.....	A-5
3.3 Resort Area Forecast.....	A-6
4. State Forecast Product (SFP) Guidelines and Examples.....	A-7
4.1 One Geographic Segment.....	A-7
4.2 Multiple Geographic Segments and Multiple Offices.....	A-7
4.3 Update and Correction Format Examples.....	A-9
4.3.1 Update.....	A-9
4.3.2 Correction.....	A-9
5. Zone Forecast Product Guidelines and Examples.....	A-10
5.1 Zone Forecast Product Segment.....	A-10
5.2 Dry in the Morning, Precipitation in the Afternoon.....	A-10
5.3 Falling Temperatures.....	A-10
5.4 Enhanced Wording for Potential Severe Weather.....	A-11
5.5 Snowfall Accumulation (1 <sup>st</sup> Three Periods).....	A-11
5.6 Wind Chill.....	A-11

1. Area Forecast Discussion Example

WEST CENTRAL AND SOUTHWEST FLORIDA FORECAST DISCUSSION  
NATIONAL WEATHER SERVICE TAMPA BAY AREA - RUSKIN FL  
134 PM EST WED MAR 10 2004

.SHORT TERM...TONIGHT THROUGH FRI. 500 MB HEIGHT TROUGH AXIS IS NOW ABOUT OVERHEAD OR JUST A BIT EAST AND MOVING AWAY. COLD AIR ADVECTION WILL CONTINUE FOR A WHILE TODAY IN THE LOW LEVELS BUT WE WILL BEGIN TO WARM FROM THIS POINT ON ALOFT. EXPECT BAND OF CLOUDS ROTATING AROUND DEEPENING LOW PRESSURE OFF THE CAROLINA COAST TO DISSIPATE SOON...CERTAINLY BEFORE REACHING LEVY COUNTY. HIGH PRESSURE RIDGES DOWN THE SPINE OF THE STATE TONIGHT WITH LIGHT DRAINAGE FLOW AT THE SFC. MAIN SFC HIGH PROGGED TO BE SPREAD FROM ALABAMA NORTHEAST TO SOUTH CAROLINA BY EARLY THU MORNING. THIS COULD BE A BIT FAR E FOR BEST COOL AIR DRAINAGE SITUATION BUT MESOETA SUGGESTS GRADIENT WILL BE LIGHT ENOUGH TO PREVENT NERLY WINDS FROM MAKING THEIR WAY ACROSS THE STATE. WILL CONTINUE TO ADVERTISE THE CHANCE OF FROST IN THE NORMALLY COLDER LOCATIONS N OF PASCO.

SFC HIGH PRES PROGGED TO DROP S AND ALIGN E-W ACROSS THE NORTHERN GULF AND N FLORIDA PENINSULA BY THU AFTERNOON. THIS SHOULD ALLOW WINDS TO TURN NE AFTER SUNRISE...BUT EXPECT A SEABREEZE TO TURN WINDS ONSHORE AGAIN IN THE AFTERNOON. A VERY WEAK CDFNT WILL DROP DOWN INTO THE SERN STATES BY FRI MORNING WITH VERY WEAK CAA AND DISSIPATE SOMEWHERE NEAR THE CENTRAL FLORIDA PENINSULA FRI AFTERNOON. THIS WILL MAKE WIND FORECASTS A BIT TRICKY BUT SPEEDS WILL BE LIGHT AND CLOUDS WILL BE MOSTLY NON-EXISTENT.

TEMPS DURING THIS PERIOD WILL REMAIN BELOW NORMAL...SOME 5 TO 10 DEGREES TONIGHT AND THU...BUT WILL BEGIN TO MODERATE BY FRI WITH LOWER 70S N TO THE UPPER 70S S.

.LONG TERM...FRI NIGHT THROUGH WED. SFC RIDGE OVER THE SE U.S. AND W ATLC WITH WSW UPPER FLOW THURS NIGHT THROUGH SUN. THIS WILL TRANSLATE TO SE LOW LEVEL FLOW WITH TEMPS NEAR NORMAL. NO PRECIP EXPECTED...EXCEPT POSSIBLY LATE SUN AFTN AS MOISTURE BEGINS TO RETURN WELL AHEAD OF FRONT. MODELS HAVE NOW BECOME INDECISIVE WITH THE NEXT UPPER TROUGH. ORIGINALLY THE UPPER TROUGH AND ASSOCIATED CF WERE EXPECTED TO MOVE THROUGH THE AREA MON MORNING. LATER RUNS HAVE BACKED IT UP NEARLY A FULL DAY. MOST RECENT RUN NOW A LITTLE FASTER THAN LAST NIGHT/S. THUS...HAVE NUDGED POPS LATER INTO MON NIGHT AND TUE GIVEN UNCERTAINTY...BUT CONFIDENCE PRETTY LOW. NOT EXPECTING MUCH IN THE WAY OF COOL AIR BEHIND THE FRONT LATE TUE AND WED GIVEN FLAT UPPER FLOW AND LOW LATITUDE SFC RIDGE.

&&

.MARINE...WINDS OFFSHORE ARE NOW MAINLY 10 TO 15 KTS AS EXPECTED BUT SEAS AT BUOY 42036 ARE STILL UP AROUND 6 FT. SEAS SHOULD BEGIN TO SUBSIDE FAIRLY QUICKLY TONIGHT SINCE THE WIND DOES NOT HAVE MUCH WERLY COMPONENT TO IT. WAVE WATCH GUIDANCE UNDERESTIMATED THE SEA HEIGHT AT THE OFFSHORE BUOY THIS MORNING...BUT THE MODEL TREND LOOKS GOOD IN RAPIDLY DIMINISHING SEA HEIGHTS. NOT PLANNING ANY HEADLINES FOR 430 PM ISSUANCE.

&&

.FIRE WEATHER...MARGINAL FIRE WEATHER DAY IN PROGRESS WITH RELATIVE HUMIDITIES VARYING FROM 30 PERCENT SW COUNTIES TO ALMOST 40 PERCENT IN THE NE COUNTIES

WHERE LOW-LEVEL MOISTURE IS HIGHER DUE TO SOME WRAPPING AROUND THE E COAST STORM. WATCH STILL WARRANTED FOR THURSDAY...BUT IT WILL BE ANOTHER MARGINAL DURATION DAY WITH NO WIND PROBLEMS FORESEEN. THEREAFTER WE HAVE INCREASING LOW-LEVEL MOISTURE AND MAY FINALLY GET A FEW DAYS WITH NO FIRE WEATHER CONCERNS.

&&

PRELIMINARY POINT TEMPS/POPS...  
 TPA 046 070 050 073 / 00 00 00 00  
 FMY 045 076 051 078 / 00 00 00 00  
 GIF 044 072 048 076 / 00 00 00 00  
 SRQ 044 070 048 074 / 00 00 00 00  
 BKV 034 072 040 074 / 00 00 00 00

.TBW WATCHES/WARNINGS/ADVISORIES...  
 RED FLAG WARNING ALL BUT PINELLAS COUNTY UNTIL 6 PM TODAY.  
 FIRE WEATHER WATCH FOR ALL COUNTIES THURSDAY AFTERNOON.

&&

\$\$

NAME(S)/INITIALS/FCSTR ID(S) (Optional)

2. Point Forecast Matrices (Early Morning Issuance).

FOUS53 KILX 031015  
 PFMILX

POINT FORECAST MATRICES  
 NATIONAL WEATHER SERVICE LINCOLN IL  
 414 AM CST WED MAR 3 2004

ILZ027-040114-  
 CITY OF GALESBURG-KNOX IL  
 40.94N 90.44W  
 414 AM CST WED MAR 3 2004

DATE	WED 03/03/04								THU 03/04/04								FRI 03/05/04							
UTC 3HRLY	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00		
CST 3HRLY	03	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	15	18		
MAX/MIN	47								38								48							
TEMP	35	39	44	46	44	42	41	40	39	42	46	47	45	45	45	44	44	45	47	48	47	48	47	
DEWPT	31	33	35	37	39	39	39	38	37	37	38	39	40	41	41	37	32	30	29	28	27	28	27	
RH	85	79	70	71	82	89	92	92	92	82	73	74	82	86	86	76	62	55	49	46	45	46	45	
WIND DIR	E	E	SE	SE	E	E	E	E	E	E	E	E	E	E	E	SE	S	SW	W	NW	NW	NW	NW	
WIND SPD	1	5	10	9	8	8	8	8	8	10	12	12	13	14	17	19	20	23	23	20	14	14	14	
WIND GUST																	32	33	35	35	35	35		
CLOUDS	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	OV	
POP 12HR	40								40								50							
QPF 12HR	0.02								0.14								0.19							
RAIN SHWRS	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
TSTMS																	0	0	0	0	0	0		
RAIN																	0	0	0	0	0	0		
WIND CHILL	38				33				36				39				38							
MIN CHILL	32	33	39	36	33	35	39	36	39	36	34	34	39	36	34	34	39	36	34	34	39	36		

NWSI 10-503 DECEMBER 19, 2005

DATE		SAT 03/06/04	SUN 03/07/04	MON 03/08/04	TUE 03/09/04
UTC 6HRLY	06	12 18 00 06	12 18 00 06	12 18 00 06	12 18 00
CST 6HRLY	00	06 12 18 00	06 12 18 00	06 12 18 00	06 12 18
MIN/MAX		30 45	27 39	29 43	30 44
TEMP	36	32 42 41 33	29 36 36 33	30 40 39 35	32 41 40
DEWPT	25	25 26 28 28	27 28 29 27	24 24 24 24	24 25 25
PWIND DIR		W W	W NW	NW NW	NW NW
WIND CHAR		GN GN	BZ BZ	BZ GN	GN BZ
AVG CLOUDS	OV	OV B2 B2 B2	B2 B2 B2 B1	B1 B1 B1 B1	B1 SC SC
POP 12HR		10 10	30 10	10 10	10 10
FLURRIES			C C		
SNOW			C C		
RAIN			C C		

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2.1 Point Forecast Matrices (Afternoon Issuance).

FOUS51 KAKQ 021947  
PFMAKQ

POINT FORECAST MATRICES  
NATIONAL WEATHER SERVICE WAKEFIELD VA  
247 PM EST TUE MAR 2 2004

MDZ022-031000-  
SALISBURY-WICOMICO MD  
38.33N 75.50W  
247 PM EST TUE MAR 2 2004

DATE		WED 03/03/04										THU 03/04/04										FRI				
UTC 3HRLY	20 23 02 05 08 11 14 17 20 23 02 05 08 11 14 17 20 23 02 05 08 11																									
EST 3HRLY	15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06																									
MIN/MAX		42					60					41					48					45				
TEMP	66 61 52 48 45 42 48 56 59 55 49 45 43 41 43 47 48 48 46 46 45 45																									
DEWPT	53 50 50 46 42 39 40 42 43 43 44 44 42 41 43 47 48 48 46 46 45 44																									
RH	63 67 93 93 89 89 74 59 55 64 83 96 96 100 100 100 100 100 100 100 100 96																									
WIND DIR	SW SW SW W NW NW NW NW NW W S S SE SE SE W NW N NE E SE SE																									
WIND SPD	17 16 11 8 6 5 4 9 6 4 5 4 5 5 6 5 9 8 8 5 5 5 6																									
CLOUDS	BK SC BK SC SC SC FW FW FW SC SC B2 OV OV B2 B2 B2 B2 B2 OV OV OV																									
POP 12HR		40					10					40					30					30				
QPF 12HR		0.01					0					0.12					0.04					0.02				
SNOW 12HR		00-00					00-00					00-00														
RAIN SHWRS	S S C C											C C C C C C C C														
DRIZZLE																	C C C C									
RAIN																	C C C C									

DATE	03/05/04	SAT 03/06/04	SUN 03/07/04	MON 03/08/04	TUE 03/09/04
UTC 6HRLY	17 23 05	11 17 23 05	11 17 23 05	11 17 23 05	11 17 23
EST 6HRLY	12 18 00	06 12 18 00	06 12 18 00	06 12 18 00	06 12 18
MAX/MIN	48	49 63	38 54	33 54	33 53
TEMP	47 48 49	49 60 57 44	38 51 49 38	33 50 49 38	33 49 49
DEWPT	47 48 49	49 49 41 38	36 35 34 32	30 31 32 32	31 32 32
PWIND DIR	SE	SW W	NW W	NW W	SW SW
WIND CHAR	GN	BZ BZ	GN GN	BZ GN	GN BZ
AVG CLOUDS	OV B2 B2	B1 B1 SC SC	SC SC SC SC	SC SC SC B1	B1 SC SC
POP 12HR	20	20 40	10 10	10 10	10 10
RAIN SHWRS		S S C C			
RAIN	S S				

3. Recreational Report (REC) Examples.

3.1 Glacier Park Recreational Forecast.

SXUS45 KMSO 161008  
RECMSO

GLACIER PARK RECREATIONAL FORECAST  
NATIONAL WEATHER SERVICE MISSOULA MT  
400 AM MDT THU MAY 16 2002

MTZ002-162200-  
WEST OF THE CONTINENTAL DIVIDE  
400 AM MDT THU MAY 16 2002

.TODAY...MOSTLY CLOUDY THIS MORNING. PARTLY CLOUDY THIS AFTERNOON.  
HIGHS 58 TO 68.  
.TONIGHT...MOSTLY CLEAR. LOWS 33 TO 43.  
.FRIDAY...BECOMING MOSTLY CLOUDY. A SLIGHT CHANCE OF SHOWERS LATE.  
HIGHS 63 TO 73.  
.FRIDAY NIGHT...MOSTLY CLOUDY WITH A SLIGHT CHANCE OF SHOWERS. LOWS  
36 TO 46.  
.SATURDAY...PARTLY CLOUDY AND WARM...WITH A SLIGHT CHANCE OF  
AFTERNOON SHOWERS AND THUNDERSTORMS. HIGHS 68 TO 78.  
.SUNDAY AND MONDAY...PARTLY CLOUDY WITH A CHANCE OF SHOWERS AND  
THUNDERSTORMS. LOWS 38 TO 48. HIGHS 65 TO 75.  
.TUESDAY AND WEDNESDAY...MOSTLY CLOUDY AND BREEZY. A CHANCE OF SHOWERS.  
LOWS 36 TO 46. HIGHS 59 TO 69.

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MTZ009-162200-  
EAST OF THE CONTINENTAL DIVIDE  
400 AM MDT THU MAY 16 2002

.TODAY...MOSTLY CLOUDY WITH ISOLATED SHOWERS. HIGHS IN THE 40S.  
.TONIGHT...BECOMING MOSTLY CLEAR. LOWS IN THE 20S.  
.FRIDAY...PARTLY CLOUDY AND WARMER. HIGHS IN THE 50S.  
.FRIDAY NIGHT...PARTLY CLOUDY. LOWS IN THE 30S.  
.SATURDAY...PARTLY CLOUDY. A CHANCE OF SHOWERS AND THUNDERSTORMS  
DURING THE AFTERNOON AND EVENING. HIGHS IN THE 60S.  
.SUNDAY AND MONDAY...WARMER AND PARTLY CLOUDY WITH A SLIGHT CHANCE OF SHOWERS  
OR THUNDERSTORMS. LOWS 35 TO 45. HIGHS 65 TO 75.  
.TUESDAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS OR THUNDERSTORMS.  
LOWS 35 TO 45. HIGHS 65 TO 75.  
.WEDNESDAY...COOLER AND MOSTLY CLOUDY WITH A CHANCE OF SHOWERS. GUSTY WEST  
WINDS. LOWS 35 TO 45. HIGHS 55 TO 65.

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3.2 Mount Rainier Recreational Forecast.

SXUS46 KSEW 151638  
RECSEA  
WAZ018-025-161800-

MOUNT RAINIER RECREATIONAL FORECAST  
NATIONAL WEATHER SERVICE SEATTLE WA  
1000 AM PDT WED MAY 15 2002

.WEDNESDAY...MOSTLY SUNNY.  
.WEDNESDAY NIGHT...PARTLY CLOUDY.  
.THURSDAY...PARTLY CLOUDY.  
.OUTLOOK FOR FRIDAY...MOSTLY CLOUDY WITH A CHANCE OF RAIN OR SNOW  
SHOWERS.

LOCATION	(ELEVATION)	TEMPERATURE (F)	WIND DIR	SPEED (MPH)
SUMMIT	(14410)	5	NW	15-25
CAMP MUIR	(10000)	17	NW	5-15
PARADISE	(5500)	45	SW	5-15

FREE AIR FREEZING LEVEL RISING TO 6500 FEET TODAY AND TO 8000 FEET  
THURSDAY.

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### 3.3 Resort Area Forecast.

SXUS41 KAKQ 152104  
RECAKQ  
MDZ018-022-VAZ071-077-079-095-161300-

RESORT AREA FORECAST  
NATIONAL WEATHER SERVICE WAKEFIELD VA  
505 PM EDT WED MAY 15 2002

FOR THE ATLANTIC BEACHES FROM SOUTHERN NEW JERSEY THROUGH  
NORTHEASTERN NORTH CAROLINA

.OVERNIGHT...MOSTLY CLEAR. LOWS IN THE MID TO UPPER 40S. NEAR SHORE  
WAVES 1 TO 2 FEET.

.THURSDAY...PARTLY SUNNY. HIGHS IN THE UPPER 70S AND LOWER 80S. NEAR  
SHORE WAVES 2 TO 3 FEET.

THE ULTRAVIOLET INDEX FOR THURSDAY FOR ATLANTIC CITY AND WASHINGTON DC IS  
7...NORFOLK IS 8...THESE ARE CONSIDERED HIGH. BALTIMORE IS 6 WHICH IS  
CONSIDERED MODERATE.

THE RIP CURRENT THREAT FOR THURSDAY IS LOW. BUT...REMEMBER EVEN WHEN THE RIP  
CURRENT IS THREAT IS LOW...RIP CURRENTS CAN STILL OCCUR...ESPECIALLY NEAR  
INLETS...JETTIES AND SANDBARS.

SURF TEMPERATURES AT SELECTED LOCATION...

CAPE MAY NJ...58...  
OCEAN CITY MD...58...  
VIRGINIA BEACH VA...63...  
KILL DEVIL HILLS...60...  
DUCK...61...

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4. State Forecast Product (SFP) Guidelines and Examples.

4.1 One Geographic Segment.

FPUS63 KTOP 260844  
SFPKS  
KSZ001>024-026>056-058-059-061>072-074>096-098>100-262344-

STATE FORECAST FOR KANSAS  
NATIONAL WEATHER SERVICE TOPEKA KS  
344 AM CDT WED JUN 26 2002

.TODAY...PARTLY CLOUDY. A SLIGHT CHANCE OF THUNDERSTORMS SOUTHEAST...WITH A CHANCE ELSEWHERE. HIGHS 90 TO 95.  
.TONIGHT...PARTLY CLOUDY WITH A CHANCE FOR SHOWERS AND THUNDERSTORMS STATEWIDE. LOWS FROM NEAR 60 NORTHWEST TO THE UPPER 60S EAST.  
.THURSDAY...A CHANCE FOR THUNDERSTORMS WEST AND SOUTH...DECREASING CLOUDS NORTHEAST. HIGHS FROM THE UPPER 80S EAST TO THE LOWER AND MIDDLE 90S WEST.  
.FRIDAY...PARTLY CLOUDY. LOWS 55 TO 60. HIGHS FROM THE UPPER 80S TO LOWER 90S.  
.SATURDAY AND SUNDAY...CLEAR TO PARTLY CLOUDY. LOWS 60 TO 65.

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4.2 Multiple Geographic Segments and Multiple Offices.

FPUS65 KTFX 211015  
SFPMT

STATE FORECAST FOR MONTANA  
NATIONAL WEATHER SERVICE  
415 AM MDT FRI MAY 24 2002

MTZ001>007-043-250115-  
WEST OF THE CONTINENTAL DIVIDE-  
NATIONAL WEATHER SERVICE MISSOULA MT  
415 AM MDT FRI MAY 24 2002

...FLOOD WARNINGS REMAIN IN EFFECT THROUGH TONIGHT...

.TODAY...PARTLY CLOUDY SOUTH...CHANCE OF SHOWERS NORTH. HIGHS 55 TO NEAR 70.  
.TONIGHT...BECOMING MOSTLY CLOUDY WITH A SLIGHT CHANCE OF MOUNTAIN SHOWERS OVERNIGHT. LOWS 35 TO 45.  
.SATURDAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS...POSSIBLY A THUNDERSTORM. HIGHS 65 TO 70.  
.SUNDAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS...POSSIBLY A THUNDERSTORM. LOWS 38 TO 43. HIGHS 65 TO 72.  
.MEMORIAL DAY THROUGH TUESDAY...PARTLY CLOUDY WITH A SLIGHT CHANCE OF SHOWERS EACH DAY. LOWS 40 TO 50. HIGHS 65 TO 75.

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MTZ009>014-044>051-054-250115-  
CENTRAL MONTANA-  
NATIONAL WEATHER SERVICE GREAT FALLS MT  
415 AM MDT FRI MAY 24 2002

## NWSI 10-503 DECEMBER 19, 2005

.TODAY...WARMER AND PARTLY CLOUDY. HIGHS 50 TO 60.  
.TONIGHT...BECOMING MOSTLY CLOUDY. LOWS 35 TO 40.  
.SATURDAY...CONTINUED WARMING. MOSTLY CLOUDY WITH A CHANCE OF LATE AFTERNOON SHOWERS SOUTH. HIGHS 65 TO 70.  
.SUNDAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS. LOWS 40 TO 45. HIGHS 65 TO 70. GUSTY WINDS TO 30 MPH POSSIBLE NEAR SHOWERS.  
.MEMORIAL DAY...MOSTLY CLOUDY WITH A SLIGHT CHANCE OF AFTERNOON SHOWERS. LOWS IN THE LOWER 40S. HIGHS NEAR 70.  
.TUESDAY...PARTLY CLOUDY. A SLIGHT CHANCE OF AFTERNOON SHOWERS. LOWS 35 TO 40. HIGHS IN THE LOWER 70S.

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MTZ008-015-052-053-055-250115-  
SOUTHWEST MONTANA-  
NATIONAL WEATHER SERVICE GREAT FALLS MT  
415 AM MDT FRI MAY 24 2002

.TODAY...WARMER AND BECOMING PARTLY CLOUDY. HIGHS 50 TO 60.  
.TONIGHT...MOSTLY CLOUDY. LOWS 25 TO 35  
.SATURDAY...MOSTLY CLOUDY AND WARMER. A CHANCE OF SHOWERS. HIGHS 55 TO 65. GUSTY WINDS TO 30 MPH POSSIBLE NEAR SHOWERS.  
.SATURDAY NIGHT...MOSTLY CLOUDY. LOWS 30 TO 40.  
.SUNDAY...MOSTLY CLOUDY AND WARMER. CHANCE OF SHOWERS. GUSTY WINDS TO 35 MPH POSSIBLE NEAR SHOWERS. HIGHS 55 TO 65.  
.MEMORIAL DAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS. LOWS IN THE 30S. HIGHS IN THE 50S TO LOWER 60S.  
.TUESDAY...PARTLY CLOUDY. A SLIGHT CHANCE OF SHOWERS. LOWS 35 TO 40. HIGHS 68 TO 73.

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MTZ016>042-056>062-250115-  
EASTERN AND SOUTHERN MONTANA-  
NATIONAL WEATHER SERVICE BILLINGS/GLASGOW MT  
415 AM MDT FRI MAY 24 2002

.TODAY...MOSTLY CLOUDY EAST WITH ISOLATED SHOWERS OR SPRINKLES NORTHEAST. PARTLY CLOUDY SOUTHWEST. HIGHS IN THE MID 50S TO MID 60S.  
.TONIGHT...MOSTLY CLOUDY WEST. A SLIGHT CHANCE OF SHOWERS EAST. LOWS 35 TO 45.  
.SATURDAY...PARTLY CLOUDY EAST. MOSTLY CLOUDY WITH A SLIGHT CHANCE OF SHOWERS WEST. HIGHS 55 TO 65 NORTH...65 TO 75 SOUTH.  
.SUNDAY...PARTLY CLOUDY. CHANCE OF SHOWERS. LOWS IN THE 40S. HIGHS 65 TO 75.  
.MEMORIAL DAY...MOSTLY CLOUDY. LOWS IN THE 40S. HIGHS 65 TO 75.  
.TUESDAY...PARTLY CLOUDY. LOWS IN THE 40S. HIGHS IN THE 70S.

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### 4.3 Update and Correction Format Examples.

#### 4.3.1 Update.

FPUS63 KFSD ddhmm **AAA**  
SFPSD  
SDZ001>074-102130-

STATE FORECAST FOR SOUTH DAKOTA...**UPDATED**  
NATIONAL WEATHER SERVICE SIOUX FALLS SD  
time am time\_zone day mon dd yyyy

**UPDATED TODAY PERIOD TO ADD SHOWERS**

.TODAY...  
.TONIGHT...  
.TOMORROW... etc.

4.3.2 Correction.

FPUS66 KSFO DDHHMM **CCA**  
SFPCA

STATE FORECAST FOR NORTHERN AND CENTRAL CALIFORNIA...**CORRECTED**  
NATIONAL WEATHER SERVICE SACRAMENTO CA  
time am time\_zone day mon dd yyyy

**CORRECTED ERROR IN NORTHERN CALIFORNIA LOW TEMPERATURE FOR TONIGHT PERIOD**

CAZ001-002-005>010-034-037-051-065-074-075-ddhhmm-  
STATE FORECAST FOR COASTAL AREAS  
time am time\_zone day mon dd yyyy

.TODAY...  
.TONIGHT...  
.TOMORROW... etc.  
\$\$

CAZ015>019-089>092-DDHHMM-  
STATE FORECAST FOR THE CENTRAL VALLEY  
time am time\_zone day mon dd yyyy

.TODAY...  
.TONIGHT...  
.TOMORROW... etc.  
\$\$

5. Zone Forecast Product Guidelines and Examples.

5.1 Zone Forecast Product Segment.

COZ082-170200-  
PIKES PEAK ABOVE 11000 FT-  
INCLUDING...THE SUMMIT OF PIKES PEAK  
400 AM MST THU JAN 16 2003

.TODAY...MOSTLY SUNNY. HIGHS 13 TO 18. NORTHWEST WINDS 15 TO 25 MPH  
WITH GUSTS TO AROUND 55 MPH.  
.TONIGHT...PARTLY CLOUDY. WINDY. LOWS 4 TO 7 BELOW ZERO. NORTHWEST  
WINDS 20 TO 30 MPH WITH GUSTS TO AROUND 45 MPH.  
.FRIDAY...PARTLY SUNNY. HIGHS IN THE LOWER TO MID 20S. NORTHWEST  
WINDS 20 TO 30 MPH.  
.FRIDAY NIGHT...PARTLY CLOUDY. LOWS ZERO TO 7 BELOW. NORTHWEST

WINDS 20 TO 30 MPH.  
.SATURDAY...PARTLY SUNNY. HIGHS IN THE 20S. WEST WINDS 10 TO 20 MPH.  
.SATURDAY NIGHT...MOSTLY CLEAR. LOWS 1 TO 8 ABOVE ZERO.  
.SUNDAY...PARTLY CLOUDY. HIGHS IN THE MID 20S TO MID 30S.  
.SUNDAY NIGHT...PARTLY CLOUDY. LOWS 2 TO 7 ABOVE ZERO.  
.MARTIN LUTHER KING JR DAY...MOSTLY CLOUDY. HIGHS IN THE LOWER TO MIDDLE 30S.  
.MONDAY NIGHT...PARTLY CLOUDY. LOWS 2 TO 7 ABOVE ZERO.  
.TUESDAY...PARTLY CLOUDY. HIGHS IN THE MID TO UPPER 20S.  
.TUESDAY NIGHT...MOSTLY CLOUDY. LOWS 2 TO 9 ABOVE ZERO.  
.WEDNESDAY...MOSTLY CLOUDY. SLIGHT CHANCE OF SNOW SHOWERS. HIGHS 17 TO 28. CHANCE OF SNOW 20 PERCENT.

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## 5.2 Dry in the Morning, Precipitation in the Afternoon.

.SATURDAY...MOSTLY CLOUDY IN THE MORNING...THEN SNOW LIKELY IN THE AFTERNOON. HIGHS IN THE LOWER 20S. NORTH WINDS 10 TO 20 MPH BECOMING WEST EARLY IN THE AFTERNOON. CHANCE OF SNOW 60 PERCENT. (*Sky cover needed for the morning forecast, but is not necessary with the 60% POP in the afternoon.*)

## 5.3 Falling Temperatures.

.TONIGHT...RAIN ENDING AFTER MIDNIGHT AND BECOMING WINDY. NORTHWEST WINDS 20 TO 30 MPH WITH GUSTS TO AROUND 40 MPH. TURNING COLDER WITH LOWS NEAR 40. CHANCE OF RAIN NEAR 100 PERCENT.  
.TUESDAY...CLEARING...WINDY AND MUCH COLDER. TEMPERATURES FALLING INTO THE LOWER 30S BY LATE AFTERNOON. NORTHWEST WINDS 20 TO 30 MPH SLOWLY DIMINISHING TOWARD EVENING.  
.TUESDAY NIGHT...CLEAR AND BITTERLY COLD WITH LOWS OF ZERO TO 5 BELOW. LIGHT AND VARIABLE WINDS.  
.WEDNESDAY...SUNNY BUT CONTINUED VERY COLD. HIGHS 12 TO 17. WEST WINDS AROUND 10 MPH.

## 5.4 Enhanced Wording for Potential Severe Weather.

.TODAY...PARTLY SUNNY AND BREEZY. SHOWERS AND THUNDERSTORMS DEVELOPING IN THE AFTERNOON. SOME THUNDERSTORMS MAY PRODUCE LARGE HAIL AND DAMAGING WINDS. HIGHS NEAR 90. SOUTHWEST WINDS 15 TO 25 MPH. CHANCE OF AFTERNOON RAIN 80 PERCENT.

## 5.5 Snowfall Accumulation (1<sup>st</sup> Three Periods).

...HEAVY SNOW WARNING IN EFFECT FROM 7 PM THIS EVENING TO 11 AM CST TUESDAY...

.TODAY...FREEZING RAIN AND SLEET...CHANGING TO SNOW IN THE AFTERNOON. SNOW ACCUMULATION OF 1 TO 3 INCHES. TEMPERATURES FALLING INTO THE LOWER 30S. BRISK NORTH WINDS 15 TO 25 MPH. CHANCE OF PRECIPITATION NEAR 100 PERCENT.  
.TONIGHT...SNOW...HEAVY AT TIMES. ADDITIONAL ACCUMULATION OF 4 TO 7 INCHES. LOWS IN THE MID 20S. NORTHEAST WINDS 10 TO 20 MPH. CHANCE OF SNOW NEAR 100 PERCENT.

## NWSI 10-503 DECEMBER 19, 2005

.TUESDAY...SNOW TAPERING OFF TO FLURRIES BY AFTERNOON. TOTAL SNOW ACCUMULATION OF 5 TO 10 INCHES. HIGHS NEAR 30. NORTHWEST WINDS 5 TO 15 MPH. CHANCE OF MORNING SNOW 80 PERCENT.

### 5.6 Wind Chill.

...WIND CHILL ADVISORY IN EFFECT FROM 8 PM THIS EVENING TO 5 AM CST FRIDAY...

.TONIGHT...MOSTLY CLEAR AND BITTERLY COLD. LOWS NEAR ZERO...WITH WIND CHILLS AROUND 25 BELOW. NORTHWEST WINDS 15 TO 25 MPH.

## APPENDIX B - Definitions and General Terminology

This section contains meteorological terms that can be utilized in a zone forecast package. Please refer to other sources (e.g., pertinent procedural directives, The Glossary of Meteorology, 2<sup>nd</sup> edition, published by the American Meteorological Society, etc.) for more details or terms not defined here.

**Areas:** Areal coverage of non-measurable, non-convective weather and/or restrictions to visibility affecting 25 to 50 percent of a forecast zone(s).

**Blowing Snow:** Snow lifted from the surface of the earth by the wind to a height of 6 feet or more above the ground, and blown about in such quantities that horizontal visibility is reduced to less than 7 statute miles.

**Drifting Snow:** Snow raised from the surface of the earth by the wind to a height of less than 6 feet.

**Drizzle:** Very small (diameters of less than 0.02 inch), numerous, and uniformly distributed water drops that may appear to float while following air currents. Unlike fog droplets drizzle falls to the ground.

**Dry Thunderstorm:** A storm produced by a cumulonimbus cloud(s) accompanied by lightning, gusty wind, and little or no precipitation (i.e., 0.10 inch or less).

**Duststorm:** A severe weather condition characterized by poor visibility (5/8 of a mile or less), strong wind and dust-filled air over a widespread area.

**Fog:** A visible aggregate of minute water droplets near the earth's surface which reduces horizontal visibility and, unlike drizzle, does not rapidly fall to the ground.

**Freeze:** Conditions when the temperature at or near the surface is expected to be 32 degrees F or below.

**Freezing Rain/Drizzle:** Rain/drizzle that falls in liquid form but freezes on contact to form a coating of glaze upon the ground and on other exposed surfaces.

**Frost:** The formation of thin ice crystals on a cold object, such as a window or bridge, that forms by direct deposition of water vapor to solid ice.

**Haze:** A suspension in the air of extremely small, dry particles which, individually, are invisible to the naked eye. When numerous, they can restrict visibility.

**Long Duration Hazardous Weather:** Weather events in effect for three hours or more that may endanger life or property, or provide an impediment to commerce. These weather events warrant the issuance of a NWS watch, warning, or advisory.

**Measurable Precipitation:** 0.01 inches or greater of liquid precipitation or water equivalent of frozen precipitation.

**Opaque cloud cover:** The amount (in oktas) of cloud cover (sheet, layer or patch) which is sufficiently dense to completely hide or obscure anything (e.g., sun, moon, higher cloud layer) that might be above it.

**Patchy:** Areal coverage of non measurable, non-convective weather and/or restrictions to visibility affecting less than 25 percent of a forecast zone(s).

**Precipitation Event:** The occurrence of measurable precipitation within the area covered by the zone forecast group during a specified time period.

**Probability of Precipitation (POP):** The likelihood, expressed as a percent, of a measurable precipitation event (0.01") at a particular point during a specified time period.

**Rain:** Liquid precipitation, either in the form of drops larger than 0.02 inch, or smaller drops which, in contrast to drizzle, do not appear to float while following air currents.

**Sandstorm:** Particles of sand carried aloft by a strong wind. The sand particles are mostly confined to the lowest ten feet, and rarely rise more than fifty feet above the ground.

**Showers:** Precipitation characterized by the suddenness with which it starts and stops, by the rapid changes of intensity, and usually by rapid changes in the appearance of the sky.

**Significant Weather:** Weather conditions that do not meet NWS watch, warning or advisory criteria, but have an impact on people's health and well-being. Such weather may affect decisions ranging from the choice of appropriate clothing, to the planning of a major event. Examples of Significant Weather include:

Precipitation conditions:

1. Heavy rain (Large ponding/localized flooding)
2. Short duration (less than three hours) heavy snow event
3. Dry thunderstorms, especially during the summer fire season
4. Thunderstorms with frequent lightning and/or small hail
5. Snow accumulations

Non-Precipitation conditions:

- ▶ Persistent humid or dry conditions
- ▶ Rip currents

Temperature conditions:

- ▶ Record lows or highs
- ▶ Notable Wind chill/Heat Index values
- ▶ Large and/or rapid drop/rise in temperature

Wind conditions:

- ▶ Short duration convective or non-convective strong wind events (e.g., gust fronts, frontal passages)
- ▶ Sea breezes
- ▶ Foehn winds

**Sleet (ice pellets):** Generally frozen raindrops (or refrozen melted snowflakes) which usually bounce when hitting a hard surface. Sleet does not "stick" to exposed surfaces.

**Snow:** Frozen precipitation in the form of (white or translucent) ice crystals.

**Snow Flurries:** Intermittent, short duration snowfall with little or no accumulation.

**Snow Showers:** Intermittent, short duration snowfall, with possible accumulation.

**Snow Squalls:** Intense snowfall, accompanied by gusty surface wind and possibly lightning (generally moderate to heavy snow showers). Accumulation may be significant.

**Sprinkles:** Scattered droplets of unmeasurable rain.

**Thunderstorm:** A local storm produced by a cumulonimbus cloud(s) accompanied by lightning and thunder, usually with gusts of wind, heavy rain, and sometimes with hail.

**Widespread:** Areal coverage of non-measurable, non-convective weather and/or restrictions to visibility affecting more than 50 percent of a forecast zone(s).

**APPENDIX C - Federal Meteorological Handbook No. 1**

The following web link will access the latest edition of Federal Meteorological Handbook No. 1(FMH-1), "Surface Weather Observations and Reports" which embodies the United States conversion to the World Meteorological Organization's (WMO) Aviation Routine Weather Report/Aviation Selected Special Weather (METAR/SPECI) code formats. It was compiled under the auspices of the Office of the Federal Coordinator for Meteorological Services and Supporting Research and embodies the work of meteorological code experts from the United States Departments of Commerce, Transportation, Defense, and Energy. The FMH-1 incorporates all of the United States' exceptions to the international METAR/SPECI format standard that is prescribed in the World Meteorological Organization's Publication No. 306 on Meteorological Codes.

- ▶ FMH-1, Surface Weather Observations and Reports and Related Pen and Ink Changes:  
<http://www.ofcm.gov/fmh-1/fmh1.htm>

**APPENDIX D - US Department of Transportation FAA 7340.1[x] Contractions**

The following web link will access the list of official USA-AERONAUTICAL CONTRACTIONS. These approved word and phrase contractions are used by personnel of the Federal Aviation Administration (FAA). This list is also used by other agencies (including the NWS) that provide air traffic control, communications, weather, charting, and associated services.

- ▶ FAA Contractions: <http://www.faa.gov/ATPUBS/CNT/2-1.HTM>